DOCUMENT RESUME

ED 043 388

PS 003 460

AUTHOR	Alexander, Theron; And Others
TITLE	Child Development Research and Evaluation Center for Head Start, Temple University, 1968 - 1969. Annual Report.
INSTITUTION	Temple Univ., Philadelphia, Pa. Child Development Research and Evaluation Center for Head Start.
SPONS AGENCY	Office of Economic Opportunity, Washington, D.C.
REPORT NO	OEO-4126
PUB DATE	31 Aug 69
NOTE	278p.
EDRS PRICE	EDRS Price MF-$1.25 HC-$14.00
DESCRIPTORS	Achievement Need, *Cognitive Measurement, *Culturally Disadvantaged, Emotional Development, Evaluation Methods, Measurement Instruments, Motivation, Negro Dialects, *Personality Assessment, *Preschool Programs, *Program Evaluation, Research Projects, School Environment, Tables (Data), Teacher Characteristics
IDENTIFIERS	*Project Head Start

ABSTRACT

This report of the third year of a Head Start study indicates the diverse range of information gathered on two types of programs (Philadelphia's inner city and Appalachian follow-up) in which the Child Development Research and Evaluation Center at Temple University participated. Subjects in the Philadelphia sample were 158 Negro children equally balanced between the sexes who had attended any one of twelve Head Start centers. In the Appalachian sample, the majority of the 41 subjects were Caucasian. They (1) had previously experienced at least a year of Head Start (2) had been tested in the 1967-1968 evaluation program, and (3) were currently in the first grade. Investigations of cognitive, social-emotional, and physical development which utilized both standardized and specially developed instruments were undertaken. Tabular presentations of test data are included. Faculty studies and research projects which relate to assessment of the continuing influence of Head Start are also included in this document. (WY)

F-OEO 4/26
PS

ED043388

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

CHILD DEVELOPMENT RESEARCH AND EVALUATION CENTER FOR HEAD START

TEMPLE UNIVERSITY

1968 - 1969

Theron Alexander, Ph. D.
Center Director

**ANNUAL
REPORT**

AUGUST 31, 1969

The information and data in this report were obtained for the United States Government. Any interpretation to news media and any publication of information in the report can be done only with the permission of the National Head Start Office in Washington, D.C. and Temple University. Some of the material is to be published in professional journals and will be under copyright.

Office of Economic Opportunity
Contract Number 0E04126

PS003460

TABLE OF CONTENTS

Page

Acknowledgments ii

Center Personnel vii

Research and Evaluation Centers for Head Start x

Research Goals and Methodology 1

Map of Sample 3

Subjects in Sample 4

Description of Centers 5

Description of Instruments Administered to Sample 21

Tabular Presentation of Data 28

Follow Up Study -- Appalachia 49

REPORTS OF FACULTY STUDIES

A Comparison of Disadvantaged Negro Children on the Stanford Binet Administered in Standard English and in the Negro Dialect Under Two Conditions of Reinforcement
Lorene C. Quay 73

Emotional Characteristics of Disadvantaged Children of Appalachia
Theron Alexander 97

TABLE OF CONTENTS (cont'd)

		Page
Project III	Studies I-VIII Beller, E. Kuno	109
Study I	The Concept Readiness and Several Applications to Disadvantaged Children	116
Study II	Use of Multiple Criteria to Evaluate Effects of Early Educational Intervention on Subsequent School Performance	134
Study III	The Effects of Nurturance Deprivation in Lower Class Black Children: Part II	141
Study IV A	A Developmental Study of the Effects of Different Types of Reinforcement on Problem-Solving in Children	150
Study IV B	The Relative Effectiveness of Candy as a Reinforcer on Problem-Solving in Lower-Class, Preschool Children	162
Study V	The Teacher-Child Interaction and the Impact of Head Start Programs on Cognitive Development in Disadvantaged Preschool Children: Part II	180
Study VI	An Experimental Study of Teaching Styles and Creativity in Children	183
Study VII	Continuities of Home and School Environments and Their Effect on Problem-Solving in Elementary School Children	206
Study VIII	Moral and Cognitive Development in Lower Class Children: Part II - Perception	220
Increasing Children's Achievement Behavior and Measured Intelligence through "Need Achievement" Training Kowatrakul, S., and Stivers, E. H.		234

ACKNOWLEDGMENTS

UNIVERSITY ADMINISTRATION

Paul R. Anderson, President

Sterling K. Atkinson, Vice President for Financial Affairs and Treasurer

Lloyd Lawrence, Vice President for Development

Edwin P. Adkins, Associate Vice President for Research and Program Development

John J. Adams, Assistant Vice President for Finance and Assistant Treasurer

Richard L. Harrington, Assistant Vice President for Research and Program Development

William H. Chapman, Assistant Director for Research

Richard W. Smith, Assistant Director for Sponsored Research

COLLEGE OF EDUCATION

Paul W. Eberman, Dean

Russell Hill, Assistant Dean for Research and Development

Warren Groff, Assistant Dean for General Administration

Division of Educational Psychology

Herbert C. Quay, Chairman

Norman Chansky, Professor (Consultant)

COLLEGE OF LIBERAL ARTS

George W. Johnson, Dean

George W. Harrington, Associate Dean

Department of Psychology

Hughbert C. Hamilton, Chairman

SCHOOL OF MEDICINE

William P. Barba, II, M.D., Acting Dean

Department of Pediatrics

Victor C. Vaughan, III, M.D., Chairman

John B. Bartram, M.D., Professor

Evelyn B. Wilson, M.D., Assistant Professor

Department of Child Psychiatry

Philip T. Band, M.D., Assistant Professor

Marc A. Forman, Instructor

SCHOOL OF BUSINESS ADMINISTRATION

Seymour L. Wolfbein, Dean

Department of Statistics

William C. Stewart, Chairman

Judith Stoyle, Professor

Donald A. Cahill, Instructor

Management Department

Samuel M. Wilson, Chairman

SCHOOL OF COMMUNICATIONS AND THEATER

Kenneth Harwood, Dean

Department of Journalism

Edward J. Trayes, Assistant Professor

UNIVERSITY COMPUTER SERVICE

Eugene Magnier, Acting Director

John Wood, Manager

Stephen Tomasco, Supervisor of Electronic Accounting
Machine Area

Harvey Karlin

OFFICE OF ECONOMIC OPPORTUNITY

Richard E. Orton, Associate Director

Lois-ellin Datta, Coordinator of Evaluation

Edith Grotberg, Coordinator of Research

Elizabeth Krone, Administrative Officer

Virginia Rainey, Administrative Officer

STEPHENSON-BROTHERS PRINTERS

Robert Stephenson, Vice President

Mildred Hunsberger, General Manager

Phoebe Snover, Art Director

Christine Worrick, Production Manager

ADVISORY COMMITTEE FOR THE CHILD DEVELOPMENT RESEARCH CENTER 1968-69

Russell A. Hill, Chairman
Assistant Dean for Research and Development
College of Education

Theron Alexander, Center Director
and Professor of Educational Psychology
College of Education

Anthony Amato, Professor
Department of Elementary Education
College of Education

William P. Barba, II, M.D., Acting Dean
School of Medicine

E. Kuno Beller, Professor
Department of Psychology
College of Liberal Arts

George W. Harrington, Associate Dean
College of Liberal Arts

Robert W. Payne, Professor
of Psychology and Chairman
Department of Behavioral Science
School of Medicine

John D. Stark, Associate Professor
Department of History
College of Liberal Arts

Sidney Sussman, M.D.
St. Christopher's Hospital for Children

Victor C. Vaughan, III, M.D.
Chairman and Professor
Department of Pediatrics
St. Christopher's Hospital for Children

Paul W. Eberman, Dean
College of Education (member ex-officio)

George W. Johnson, Dean
College of Liberal Arts (member ex-officio)

COMMUNITY ADMINISTRATION REPRESENTATIVES

Jeffrey Jones, Director
Pre-Kindergarten Project
Philadelphia Board of Education

Rosemary Mazzatenta, Assistant Director
Pre-Kindergarten Project
Philadelphia Board of Education

Lafayette Powell, Director of Psychological Services
Pre-Kindergarten Project
Philadelphia Board of Education

Mildred Davis, Director
Project Head Start
Douglas High School
Kingsport, Tennessee

Willard Mauller, Director
Project Head Start
Taylor County Rural Areas Development Corporation
Grafton, West Virginia

Jessie McFerrin, Coordinator of Early Childhood Program
Knox County Economic Opportunity Council
Barbourville, Kentucky

CENTER PERSONNEL

Theron Alexander, Ph.D., Center Director and Professor of Human Development, Division of Educational Psychology

National Data Program

Cathleen Kubiniec, Ph.D., Assistant Professor, Division of Educational Psychology

James Roberge, Ph.D., Assistant Professor, Division of Educational Psychology

Judith Goodwin, B.A., Center Coordinator

Secretaries

Barbara W. Dole
Susan Gosman
Margaret McLoughney

Research Associates

Margaret Havard, B.A.
Patricia Phillips, B.A.
Charles Slater, M.A.
Mary Trayes, M.S.*
Nancy Weidenfeld, M.Ed.

Research Assistants*

Patricia Newman, A.B.
Natalie Sanders, M.Ed.
John Tighe, M.S.
Paula Weitzman, M.A.

Faculty Research Projects

Project I

Thomas V. Busse, Ph.D., Principal Investigator, Assistant Professor,
Division of Educational Psychology

Marilyn Gutride, B.S., Research Associate

Susan Lyons, Student Assistant*

Research Assistants*

Patricia Blum, B.A.

Malcolm Ree, M.A.

Project II

Lorene C. Quay, Ph.D., Principal Investigator

Research Assistants

Harry L. Gordon, III

Morris Peterkin, B.S.

Loretta Westler, B.S.

Project III

Surang Kowatrakul, Ph.D., Co-Investigator, Associate Professor,
Division of Educational Psychology

Eugene Stivers, Ph.D., Co-Investigator, Associate Professor,
Division of Educational Psychology

Valerie Floyd, Secretary

Research Assistants*

Heather Rabinowitz, B.A.

Robert Shaffer, A.B.

Student Assistants*

Marcy Kobran

Esther Jackson

Elaine Texter

Project IV

E. Kuno Beller, Ph.D., Principal Investigator, Professor, Department of Psychology

Thomas Spiritoso, M.A., Statistical Consultant

Janet Sorenson, Secretary

Research Assistants*

Matthew Back, B.A.

Gerald Cimme[illegible], M.S.

David Graham, M.A.

Olga Prochurska, M.A.

---

*part-time

Research and Evaluation Centers for Head Start

University	Director	Region
Bank Street College	Dr. Herbert Zimiles	New York City (overlaps with Teachers College), Maryland, Delaware, New Jersey, and D.C.
Boston	Dr. Frank Garfunkel	New England
Hawaii	Dr. Virginia Shipman	Hawaii, Guam, Samoa, Alaska, Washington, and Oregon
Kansas	Dr. Russell Tyler	Kansas, Nebraska, Western Missouri, Colorado, Wyoming, Montanta, and North and South Dakota
Michigan State	Dr. Robert Boger Dr. Marilyn Story	Wisconsin (except Chicago suburbs), Michigan, Minnesota, Western Ohio, and Iowa
South Carolina	Dr. Myles Friedman	South and North Carolina, Virginia, Georgia, and Florida
Syracuse	Dr. William Meyer	New York State (excluding 75 mile radius of New York City), Western Pennsylvania, Eastern Ohio, Puerto Rico, and Virgin Islands
Temple	Dr. Theron Alexander	Urban Philadelphia, Central and Eastern Pennsylvania West Virginia, Eastern Kentucky, and Eastern Tennesse (i.e., "Appalachia")
Texas	Dr. John Pierce-Jones	Texas, New Mexico, Arizona, Oklahoma, and Utah
Tulane	Dr. Shuell Jones	Louisiana, Alabama, and Mississippi
Southern	Dr. Edward Johnson	Louisiana, Mississippi, and Arkansas
U. C. L. A.	Dr. Carolyn Stern	California (all), and Nevada

RESEARCH GOALS AND METHODOLOGY

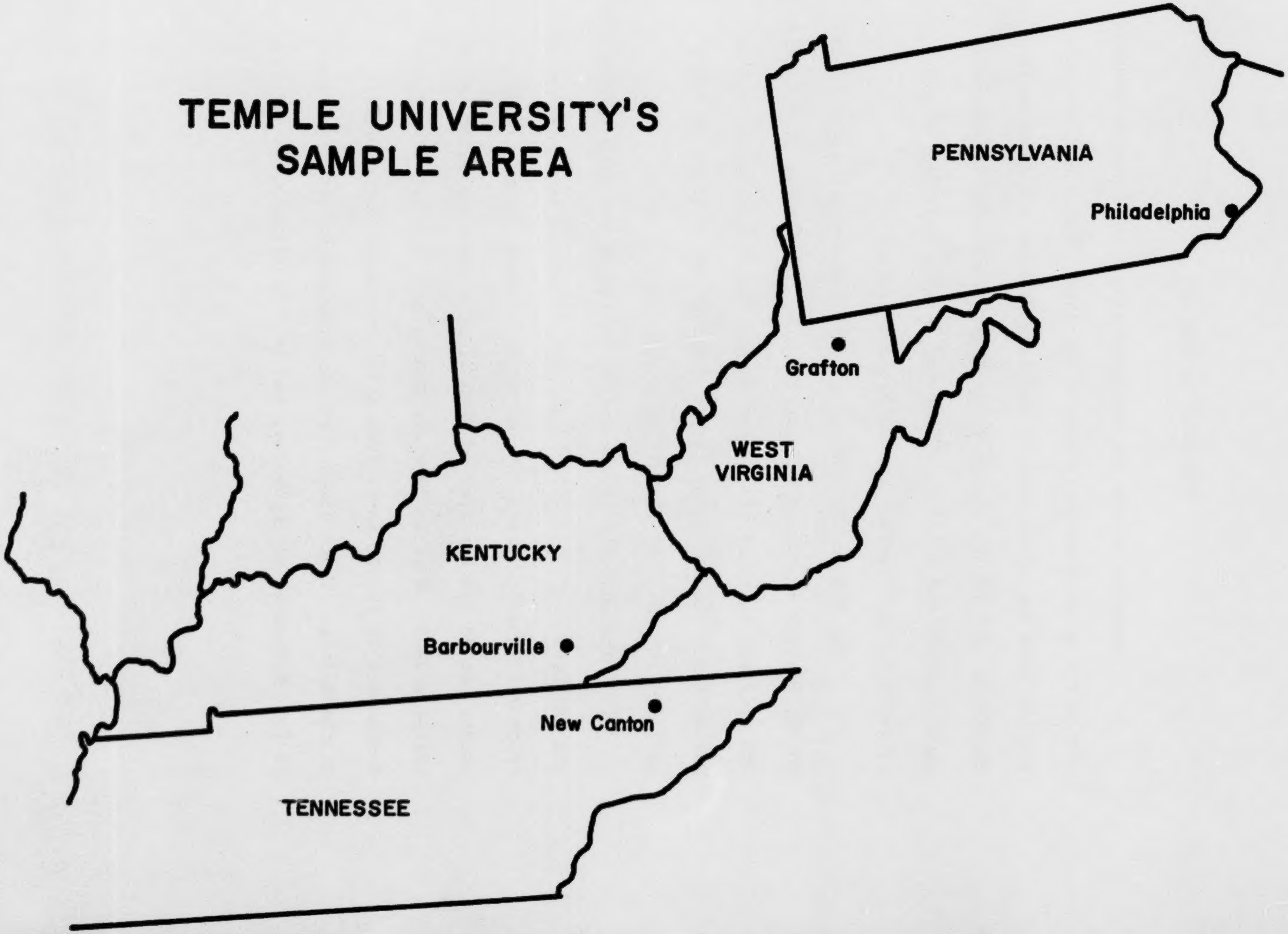
Child Development Research and Evaluation Center
The National Data Program at Temple University

This year has completed the final year of a three year study of Head Start by the Child Development Research and Evaluation Center. Temple was the only university in the National Evaluation to study children who live in an urban area characterized by great physical, social, intellectual and economic deprivation. The number of sample centers was doubled this year to include as many children as possible from the "inner city". The addition of new tests and instruments allowed for more intensive study of this sample through the investigation of a wider range of problem areas. Cognitive, social-emotional and physical development were assessed to provide us with understanding of the developmental patterns of these children. As a consequence of research like this, programs can be expanded to maximize stimulation and improvement.

As part of the Head Start Evaluation, Temple University's Center also collected follow-up data from children who were in last year's Appalachian sample. These children who had the benefits of Head Start experience were studied at the end of first grade. This is part of a continuing concern for the long term effects of remedial programs.

Both the faculty and graduate students who have been involved in the Center have diversified experience which allowed for expertise in areas relevant to this year's evaluation. Studying samples of young children in both Philadelphia and Appalachia has given them an opportunity to broaden their own personal backgrounds and to understand more fully one of the major social crises in urban civilization.

TEMPLE UNIVERSITY'S SAMPLE AREA


PENNSYLVANIA
Philadelphia
Grafton
WEST VIRGINIA
KENTUCKY
Barbourville
New Canton
TENNESSEE

Subjects in Sample

Subjects in the Philadelphia sample were chosen according to the guidelines dated August 23, 1968. There were twelve Centers with one class each of English-speaking pre-kindergarten children. All of the children are Negroes and were between the ages of 3-1/2 and 4-1/2 as of October 1. The majority of the subjects had no previous Head Start experience.

The sample was divided equally between the sexes (males 50.6%, females 49.4%) as suggested in the guidelines. There were 158 children in the initial testing and 133 in the final testing. All of the children in the sample received the battery of tests outlined for the 1968-69 National Evaluation Program.

The subjects in the Follow-Up sample are from Appalachia and had been tested in 1967-68 as part of the National Evaluation Program. These children, the majority of whom are now in first grade, had at least a year of Head Start experience prior to entering school. Most of them are Caucasian. The battery of tests designated by the National Evaluation Follow-Up was administered in the spring. There are 8 children from New Canton, Tennessee, 23 from Barbourville, Kentucky, and 10 from Simpson, West Virginia.

DESCRIPTION OF PHILADELPHIA HEAD START CENTERS

All of the Centers are under the administrative control of the Philadelphia Board of Education's Prekindergarten Project. The year-round Head Start Program here is called "Get Set." OEO distributes funds to the Philadelphia Anti-Poverty Action Committee which in turn provides the funds to the Board of Education for the program.

Annunciation, Twelfth and Diamond Streets, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 30).

This Get Set Center is located in the Church of the Annunciation at the edge of the Temple University campus. The neighborhood is mainly residential consisting of row houses.

The sample class is located on the second floor of the church, and another class occupies a room on the first floor. Classrooms are fairly small, dimly lit, but adequately equipped. There is a room on the first floor equipped with a sandbox and climbing equipment. There is also a basement area where the children ride tricycles and use gymnasium equipment. Each class has its own lunch area on the first floor. For outdoor activity there is a playground within walking distance and the children sometimes go on neighborhood walks.

The two classes are both full-day ones with each having a teacher and an aide. A cook prepares hot lunches and snacks daily for the children.

PS 003460

Berean, Broad and Diamond Streets, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 40).

This Get Set Center is located in the Berean Methodist Church on the corner of Broad and Diamond Streets in North Philadelphia not far from Temple University. Situated on one of Philadelphia's main thoroughfares, the church is located in a heterogeneous neighborhood including some deteriorated residential dwellings and many active commercial establishments.

The church is a well-preserved structure of some architectural interest. Two regular Get Set classes are conducted in classrooms on the first floor. There is also a special class for five nursery school age children with some developmental problems. The classrooms are bright and well-equipped, although somewhat small. Two rooms adjacent to the classrooms provide adequate space for testing and interviews. A large basement joined by kitchen facilities serves as an indoor recreation room and dining room for the children. In warm weather the children have use of a playground about five blocks away. There are no outdoor play facilities in the immediate vicinity.

The three classes are full-day ones. Staff includes a teacher and an aide for each class and a cook.

Emmanuel Institutional, 1730 North Twenty-second Street, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 35).

The Emmanuel Institutional Center is located in a quiet block of row houses near a congested, commercial street in North

Philadelphia. Across the street from the church, clearing of the entire block is underway.

This Center occupies the first floor and basement of the church building. There are two classes located in rooms on either side of an auditorium. The sample class has the largest room with windows on two sides but there is not enough play or work area for twenty children. At times the class uses the auditorium for free play and music periods as it has a piano. There is no outdoor play area but the children are often taken on neighborhood walks. However, a Youth Community Center is being built across Twenty-second Street and the Center will probably have the use of the facilities. Hot lunches are prepared by a cook and served in the church basement.

Both classes are full-day ones. The staff consists of two head teachers and two aides plus volunteers from time to time.

First Methodist Church of Germantown, Germantown Avenue and High Street, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 75).

First Methodist Church is located on Germantown Avenue in an integrated lower middle class neighborhood. It is bounded by Germantown High School and a section of small stores.

There are four classes at the Center, three of which are located on the second floor and one (the sample class) on the ground floor. Classrooms are fairly large, adequately lighted, and well-equipped. There is a large room used as a gymnasium with equipment such as wheelbarrows, boards, rocking boat, climber, ropes, and balls.

A small fenced-in yard and a city playground are within walking distance. There is also a lunchroom next to the kitchen where three of the classes eat lunch. Children get a hot lunch and a morning and afternoon snack daily.

All four classes are full-day ones with twenty children in three classes and fifteen children in one class. The staff consists of a head teacher, an aide for each class, and a cook and her assistant.

Janes Methodist Church, 47 East Haines Street, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 51).

Janes Methodist Church is located in the Germantown section of Philadelphia in an integrated, lower middle class neighborhood. The Center is bounded by Germantown Senior High School, Fulton Elementary School across the street, and a section of small stores. This Center is located only one block away from the First Methodist Center.

There are four classes at the Center. The sample class is an all-day class; and there are two half-day classes, one in the morning and one in the afternoon. There is also an all-day class for retarded children. Since there are only three classrooms, the half-day classes share a room. The rooms are small but adequately lighted and well-equipped. The sample class is especially well-equipped. Play space includes a gymnasium with equipment, a small yard outside, and a city playground within walking distance. Children are served a hot lunch and a morning and afternoon snack daily.

There are fifteen children in the sample class, fifteen in the morning class, twelve in the afternoon class, and nine in the retarded group. Each class is staffed by a head teacher and an aide. Other staff includes a cook and a custodial aide.

Jones Memorial, Twentieth and Dauphin Streets, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 80).

This Center is located in the basement of a small Baptist Church in an urban Negro neighborhood in North Philadelphia. In the vicinity of the school are row houses and boarded-up stores.

Three classroom areas are in one large room, partitioned off by plywood dividers five feet high. Two classes are held in the main section of the room and one (the sample class) is on a small stage separated from the room by the stage curtain. The Center's equipment is limited. There is an outdoor play area with little equipment. The kitchen is on the same floor as the class. Snacks and lunches are served near or in the classroom areas.

The Center has five classes, two morning, two afternoon, and one all-day. Four classes have fifteen children, and the full-day class has twenty children. Each class has its own teacher and aide. Parents are frequent volunteer helpers in the classroom. There are two cooks.

Jones Tabernacle, Twentieth and Diamond Streets, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 80).

Jones Tabernacle is a large African Methodist Episcopal Church in a North Philadelphia urban residential Negro neighborhood. Many of the streets are well kept.

The three classrooms are in the side rooms of the church on two floors. All the rooms are well equipped, well heated, but poorly lighted. There is no playground outside. The classes take many neighborhood walks. The kitchen is on the basement floor, where all lunches are served. Snacks are brought up to the classrooms.

The four classes are full-day and have twenty children each. Staff includes a teacher and an aide for each class and a cook.

New Salem, 1720 North Croskey Street, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 35).

This Center is located in a small church in an urban Negro neighborhood in North Philadelphia. It is surrounded by row houses. A busy commercial area is nearby.

There are two classrooms which are situated on the first floor in a side section of the church. The sample class has the larger room with enough place for free play, for snacks and meals, and for rest periods. In contrast, the outdoor play area is quite small (10 x 20 feet). There is a substantial amount of equipment for active play.

The two classes are full-day ones. Each is staffed by a teacher and an aide. One cook prepares hot lunches and snacks for the children.

Open Door, 1632 North Twenty-sixth Street, Philadelphia, Pennsylvania; Grant Number 2059 (Number of pupils = 44).

The Open Door Center is located in a church one block south of Columbia Avenue, a main street in North Philadelphia. The area is semi-residential and consists of small stores and row houses.

The Center houses three Get Set classes which are located on the first floor of the building. Each class has its own room which is separated from the others by glass and wood partitions. The playground that the Center uses is located two blocks away from the church where there is outdoor play equipment and open space for play.

The three classes are full-day ones. Staff includes a teacher and an aide for each class and a cook who prepares hot lunches and snacks daily for the children.

St. Paul's, 1018 Wallace Street, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 46).

This Center is located in a recently constructed community center adjacent to St. Paul's Methodist Church. The area is predominantly residential, though it is bordered to the south and east by commercial and light industrial establishments. The church-run center is staffed by several full-time employees who organize recreational and community oriented programs for the neighborhood residents.

Entrance to the Get Set classrooms is from a rear lane which faces a playground equipped with a slide, sand box, and jungle gym. The three classrooms of the Center are located in the basement as well as a small library and game room used for testing. The classrooms are freshly painted, well lit, and clean. The children are served meals upstairs in a large gymnasium which joins a modern kitchen. The children play here when the weather prevents their using the outdoor play area.

The three classes are full-day ones. Staff includes a teacher and an aide for each class and a cook.

Wayland Temple, 2500 Columbia Avenue, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 55).

Wayland Temple is located on a main thoroughfare in North Philadelphia. The area is mainly commercial with some row houses in the vicinity. Residents are mainly English speaking Negroes.

There are three Get Set classes at the Center located in the basement of the church. Five-foot dividers separate the classes from each other. Although the classrooms are small, they are cheerful, and well equipped. In addition to the classrooms, there is a kitchen and a small indoor play area that the classes share. There is a large playground three blocks away with standard outdoor play equipment and an open area for play that the classes use in good weather.

All three classes are full-day classes, each with a teacher and an aide. Two cooks prepare lunches and snacks daily for the children.

Zoar, Twelfth and Melon Streets, Philadelphia, Pennsylvania; Grant Number GC 2059 (Number of pupils = 31).

Zoar Get Set Center is located in a Methodist church building in a poor urban neighborhood. The area is made up mainly of houses, many of which are now abandoned.

The sample class is located on the ground floor of the church with adequate space for the children's activities. The class has access to the basement and a large auditorium. Equipment, such as tricycles, wagons, and carriages, is available. The class also eats and has its rest period in this area. Another class uses the basement area for activities, but the only time the classes are together is for the lunch period. Outdoor play space, a city playground, is located about two blocks away from the center. An alley at the back of the building is also sometimes used for outdoor activities.

The two classes are full-day ones, with a teacher and an aide each. A cook prepares hot lunches and snacks for the children.

Table 1

Facilities Available to Sample Class

Philadelphia

Head Start Centers	Children in Class	Children in Sample	Classrooms for Sample Class	Gymnasium (Indoor)	Square Footage in Classroom Space Per Child							
					14-	15-19	20-24	25-29	30-34	35-39	40-44	45+
Annunciation	15	12	1	1					X			
Berean	20	14	1	1								X
Emmanuel Institutional	20	13	1	0				X				
First Methodist	20	15	1	1					X			
Janes Methodist	15	14	1	1				X				
Jones Memorial	20	13	1/3	0		X						
Jones Tabernacle	20	13	1	0				X				
New Salem	18	11	1	0							X	
Open Door	17	15	1	0			X					
St. Paul's	15	10	1	1				X				
Wayland Temple	20	15	1	0	X							
Zoar	13	19	2	1								X

Table 1

Facilities Available to Sample Class (continued)

Philadelphia

Head Start Centers	Outdoor Play Areas						Room Lighting			Overall Condition of Room			
	None	Square Feet Per Child	Surface Type				Number of Lights	General Illumination					
			Hard	Dirt	Sand	Other		Good	Poor	Excellent	Good	Fair	Poor
Annunciation		100+	X	X	X		3	X					X
Berean		100+	X				4	X			X		
Emmanuel Institutional		39-	X				2		X				X
First Methodist		100+				X	6	X		X			
Janes Methodist		39-		X			2	X			X		
Jones Memorial		100+		X			4		X			X	
Jones Tabernacle	X	0					4		X		X		
New Salem		39-	X				2	X				X	
Open Door		40-49	X				4		X			X	
St. Paul's		100+	X				9	X		X			
Wayland Temple		100+	X				5	X			X		
Zoar		60-69	X				3		X		X		

Table 2

Age Range of Sample Children in Months

Initial Data (Fall 1968)

Philadelphia N=158

Head Start Centers	Number of Pupils	Age								
		43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58	Total
Annunciation										
Male	6			2		3		1		6
Female	5			2	1	2				5
Berean Presbyterian										
Male	6			3	1		1	1		6
Female	8		1	1	1	2	3			8
Emmanuel Institutional Baptist										
Male	7			3		2	1	1		7
Female	6		1	2		1	2			6
First Methodist										
Male	10			2		5	2	1		10
Female	6			1		2	2	1		6
Janes Methodist										
Male	7					2	2	3		7
Female	7			1	1		1	4		7
Jones Memorial Baptist										
Male	8		1	1	3	3				8
Female	6		2			3	1			6

(Table continued on next page)

Table 2 (continued)

Head Start Centers	Number of Pupils	Age 43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58	Total
Jones Tabernacle A.M.E.										
Male	5	2	2		1					5
Female	9	1	2	3		3				9
New Salem Baptist										
Male	7				4		2	1		7
Female	4					3			1	4
Open Door Baptist										
Male	7		1	2	1	2		1		7
Female	8		1		1	4	2			8
St. Paul's Baptist										
Male	5			2	1	1	1			5
Female	6	1		1	1	1	1	1		6
Wayland Temple Baptist										
Male	7		1		2	2		2		7
Female	8		1		1	2	4			8
Zoar Methodist										
Male	5			2	3					5
Female	5				2	2		1		5
Philadelphia										
Male	80	2	5	17	16	20	9	11		80
Female	78	2	8	11	8	25	16	7	1	78
Total Philadelphia	158	4	13	28	24	45	25	18	1	158

Table 3

Characteristics of Teaching Staff (Head Teacher and Aide)

Philadelphia

Head Start Centers	Age							Educational Level Attained			Years of Teaching	Lives in Neighborhood	
	19-21	22-27	28-33	34-39	40+	Negro	White	High School	College	Credit Beyond B.A.		Yes	No
Annunciation													
Head Teacher				X		X				X	16		X
Aide			X			X		X			2	X	
Berean Presbyterian													
Head Teacher				X		X				X	13		X
Aide					X	X			X		13		X
Emmanuel Institutional Baptist													
Head Teacher #1				X		X			X		*	X	
Head Teacher #2		X				X			X		1		X
Aide #1					X	X			X		3	X	
First Methodist													
Head Teacher					X		X		X		6		X
Aide				X		X		X			1		X
Janes Methodist													
Head Teacher					X		X		X		2		X
Aide					X	X			X		3		X
Jones Memorial Baptist													
Head Teacher			X				X			X	6		X
Aide					X	X		X			7	X	

* = unknown

(Table continued on next page)

Table 3 (continued)

Head Start Centers	Age							Educational Level Attained			Years of Teaching	Lives in Neighborhood	
	19-21	22-27	28-33	34-39	40+	Negro	White	High School	College	Credit Beyond B.A.		Yes	No
Jones Tabernacle A.M.E.													
Head Teacher #1		X					X			X	2		X
Head Teacher #2		X					X		X		0		X
Aide			X			X		X			6	X	
New Salem Baptist													
Head Teacher #2				X		X				X	6		X
Aide				X		X			X		3		X
Open Door Baptist													
Head Teacher		X				X			X		2		X
Aide	X					X		X			3		X
St. Paul's Baptist													
Head Teacher				X		X				X	6		X
Aide					X	X		X			4	X	
Wayland Temple Baptist													
Head Teacher				X		X			X		5		X
Aide					X	X		X			3		X
Zoar Methodist													
Head Teacher			X			X				X	6		X
Aide #1			X			X			X		2	X	
Aide #2		X				X		X			0	X	

Data Gathering Techniques

1968-1969

The Stanford-Binet Intelligence Scale

The Binet was administered during the initial and final phases of the Head Start program to determine whether or not any changes took place in the intellectual functioning (IQ) of the sample children.

The Stanford-Binet requires the child to perform on tasks involving such skills as visual discrimination, memory, language usage, and abstract thinking. Developmental tasks such as drawing figures, block building, and bead stringing are also essential features of the scale.

Data from the picture vocabulary test was also used as part of the Temple University Enrichment Study evaluation.

Inventory of Factors

The Inventory of Factors was designed to assess the extent to which certain variables affected the child's performance on the Stanford-Binet.

Factors such as attention-span, comprehension, and testing conditions are observed to determine to what degree they affect performance.

Birch Response Style

The Birch requires a tester to record the child's response style for each item of the Binet.

Behavior was recorded to indicate the precision with which each item verbal or nonverbal task was carried out. The manner of avoiding a task was also recorded. Account was kept of the number of questions the examiner used to elicit a child's response.

Pre-School Inventory (PSI)

The PSI was developed to show a measure of achievement in areas regarded as necessary for success in school. One aim of this test is to permit educators to determine performance deficits that a child from a deprived background has at the time of entering school.

The child is required to answer questions with verbal and nonverbal responses. The test was administered in the initial and final phases of the Head Start program.

Animal House of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI)

The Animal House is one of the Performance tests of the WPPSI. It requires the child to associate sign with symbol and may be considered as a measure of learning ability. Memory is a basic factor with attention span, goal awareness, and ability to concentrate also being involved.

The test was administered during the initial and final phases of the Head Start program. Data from the test were used as part of the Temple Enrichment Study as well as part of the common core data of the National Evaluation.

Gumpgookies

The Gumpgookies is a test designed to measure the achievement motivation of young children.

Sets of two analogous figures (called Gumpgookies) are shown to the child and he must choose the one which resembles himself.

This test was administered in the initial and final phases of the Head Start program. Data were also used as part of the Temple University Enrichment Study evaluation.

Observation of Substantive Curricular Input (OSCI)

The OSCI is designed as a comprehensive record of on-going classroom activity. The observations provide data from which it would be possible to reconstruct a picture of curricular input in a particular classroom. Information consists of: 1) content of activity (general activity such as creative arts, discussion); 2) content of activity (the nature of curricular input the child is receiving from the activity or the teacher; for example, language skills and social interaction); 3) teacher involvement; 4) locus of control (whether the child, teacher, or aide is in control of the activity; and 5) materials used.

Post Observation Teacher Rating Scales (POT)

The POT is a five-point rating scale of comprehensive behavior categories which reflect the atmosphere of the classroom as determined by the teacher.

Observers rated the teachers once in October and after each OSCI observation.

Parent Interview

The Parent Interview provides demographic, sociological, and attitudinal information about the family life of the children with emphasis on the social and emotional relationships in the family.

The interview contained items such as the number of children, adults, and rooms in the home; the parent's perception of Head Start's effect (if any); educational aspirations and expectations; social-emotional characteristics of the child, child rearing patterns, and educational attitudes.

Play-Board Sociometric Technique

The sociometric technique was used to analyze the children's social relationships.

Colored photographs of all the children in a class, mounted on a board, were presented to the child. Five drawings of familiar playthings such as dolls and see-saws were also presented. The child is asked to choose three pictures of things he like best and then is to choose the picture of the child he would most like to play with for each situation.

This test was administered during the initial and final phase of the Head Start program. Data were also used as part of the Temple University Enrichment Study evaluation.

Temple University Enrichment Study Techniques

Wechsler Preschool and Primary Scale of Intelligence (WPPSI)

(Used in initial and final testing.)

The WPPSI was one measure used to study the effect of an enriched classroom environment. It was hypothesized that: 1) the enrichment material provided would affect ability on performance tasks rather than on verbal tasks and 2) the children's verbal ability would be measured by the Stanford-Binet and thus only the performance items of the WPPSI were administered.

Animal House

The Animal House tests was administered at the same time as the other WPPSI performance tests. The data were used for the common core of the National Evaluation and Temple's Enrichment study.

Picture Completion

The WPPSI Picture Completion Test requires the child to identify the missing part of a picture of an object.

Mazes

In the WPPSI Mazes subjects are required to work their way through several simple mazes before proceeding to the more difficult square mazes.

Geometric Design Test

The WPPSI Geometric Design Test requires the child to reproduce geometric figures. Abilities measured by the test depend primarily on perceptual and visual-motor organization, the development of which is closely tied to increasing chronological age.

Block Design Test

The WPPSI Block Design Test is a sorting as well as a perceptual-motor test for young children. The child must identify colors and geometric forms before assembling the blocks into a pattern.

Illinois Test of Psycholinguistic Abilities (ITPA)

The purpose of the ITPA is to delineate specific abilities and disabilities in children in the areas of communication and learning disorders. It was hypothesized that the enrichment material provided as part of the Temple University Enrichment Study would most affect abilities in the areas of auditory and visual perception. Therefore, four of the twelve ITPA subtests which measure abilities in these areas were chosen to be administered during the initial and final phases of the Head Start program.

Auditory Reception

The ITPA Auditory Reception Test is designed to assess the child's ability to derive meaning from verbally presented material.

Visual Reception

The ITPA Visual Reception Test is comparable to the Auditory Reception Test but utilizes a different sense modality; it is a measure of the child's ability to gain meaning from visual symbols.

Auditory Sequential Memory

The ITPA Auditory Sequential Memory Test assesses the child's ability to reproduce from memory sequences of digits increasing in length from two to eight digits.

Visual Sequential Memory

The ITPA Visual Sequential Memory Test assesses the ability to reproduce sequences of nonmeaningful figures from memory.

Teachers' Encouragement of Usage of Equipment and Supplies (TE)

The aim of this instrument is to determine the amount of encouragement given by a particular teacher to group and individual subjects. This measure was used at all the sample centers with all teachers between initial and final testing.

Preschool Observation Schedule (POS)

The purpose of this measure is to categorize the play of one individual into specific operationally defined categories. Behavior is divided into "approaches to play" and "aggressive behavior." Only "aggressive behavior" directed against peers is applicable.

Table 4

Stanford-Binet Intelligence Scores

Initial Testing (Fall 1968)

Philadelphia N=159

Head Start Centers	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Annunciation				
Male	6	72-111	86.00	15.76
Female	6	89-111	100.66	7.06
Berean Presbyterian				
Male	6	72-105	86.33	11.18
Female	8	89-119	103.25	10.70
Emmanuel Institutional Baptist				
Male	7	75-114	93.85	10.49
Female	6	70-111	88.50	13.89
First Methodist				
Male	10	79-113	101.50	10.27
Female	6	96-128	107.00	12.08
Janes Methodist				
Male	7	92-122	101.85	11.56
Female	7	90-109	99.42	6.45
Jones Memorial Baptist				
Male	8	71-117	96.50	14.04
Female	7	85-115	95.00	10.96
Jones Tabernacle A.M.E.				
Male	5	81-100	91.00	8.00
Female	9	74-118	98.55	11.86
New Salem Baptist				
Male	6	83-119	98.83	13.83
Female	5	59-116	83.00	21.94
Open Door Baptist				
Male	7	67-119	90.28	15.35
Female	8	67-97	88.12	11.53
St. Paul's Baptist				
Male	6	91-111	97.50	7.25
Female	4	85-103	93.50	8.06
Wayland Temple Baptist				
Male	6	58-105	83.83	15.06
Female	9	69-95	83.77	11.15
Zoar Methodist				
Male	5	84-111	97.40	11.37
Female	5	76-93	84.80	7.04
Philadelphia				
Male	79	58-122	94.25	12.92
Female	80	59-128	94.04	13.25
Total Philadelphia	159	58-128	94.14	13.05

Table 5

Stanford-Binet Intelligence Scores

Final Testing (Spring 1969)

Philadelphia N=135

Head Start Centers	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Annunciation				
Male	6	82-100	90.00	8.02
Female	5	90-107	101.00	5.70
Berean Presbyterian				
Male	5	78-103	95.40	10.06
Female	7	105-121	111.71	5.40
Emmanuel Institutional Baptist				
Male	6	92-109	99.50	5.89
Female	6	80-107	96.33	11.34
First Methodist				
Male	9	90-118	104.66	7.79
Female	5	110-129	118.40	8.67
Janes Methodist				
Male	7	98-122	106.14	9.38
Female	7	103-125	112.42	9.34
Jones Memorial Baptist				
Male	6	81-113	102.83	11.60
Female	4	92-103	97.50	5.32
Jones Tabernacle A.M.E.				
Male	4	91-111	102.00	9.89
Female	6	82-123	101.16	14.16
New Salem Baptist				
Male	5	91-124	104.40	12.44
Female	5	79-112	92.80	12.71
Open Door Baptist				
Male	6	90-137	105.66	18.00
Female	7	94-103	95.28	7.15
St. Paul's Baptist				
Male	5	91-117	102.40	10.71
Female	4	81-100	92.25	8.05
Wayland Temple Baptist				
Male	5	84-107	95.40	10.11
Female	7	81-107	92.71	8.75
Zoar Methodist				
Male	4	99-113	107.56	6.19
Female	4	78-99	91.00	9.48
Philadelphia				
Male	68	78-137	101.46	10.81
Female	67	78-129	100.81	12.25
Total Philadelphia	135	78-137	101.14	11.50

Table 6

WPPSI Performance Scores

Initial Testing (Fall 1968)

Philadelphia N=150

Head Start Centers	Number of Pupils	Animal House			Performance IQ		
		Range of Scaled Scores	Mean Scaled Scores	SD	Range	Mean	SD
Annunciation							
Male	6	4-10	6.33	2.33	67-97	78.00	10.58
Female	6	6-14	9.50	3.05	67-101	89.00	13.35
Berean Presbyterian							
Male	6	6-10	8.33	1.63	76-104	92.50	10.98
Female	8	6-12	9.00	2.27	78-101	90.50	8.89
Emmanuel Institutional							
Male	6	5-9	7.16	1.60	82-107	89.00	9.47
Female	6	2-10	7.50	3.08	64-96	79.83	13.79
First Methodist							
Male	9	4-12	8.33	2.55	76-107	92.88	10.69
Female	6	7-11	8.66	1.36	88-114	101.33	10.94
Janes Methodist							
Male	7	4-16	8.14	4.26	82-139	95.57	19.80
Female	7	8-12	8.71	2.36	87-99	95.43	15.51
Jones Memorial Baptist							
Male	7	5-12	8.29	2.28	82-107	89.28	9.59
Female	5	8-12	9.40	1.94	87-99	92.40	5.18
Jones Tabernacle A.M.E.							
Male	4	6-12	8.50	2.65	82-104	95.25	9.57
Female	8	4-16	10.12	3.72	80-103	93.75	8.13
New Salem Baptist							
Male	6	5-14	9.66	3.08	86-116	98.33	9.89
Female	5	5-14	8.60	3.78	75-114	86.80	15.86
Open Door Baptist							
Male	7	5-11	6.85	3.89	67-107	74.00	35.99
Female	8	5-14	8.37	2.77	64-96	84.25	10.18
St. Paul's Baptist							
Male	5	4-10	8.00	2.43	76-99	92.00	9.22
Female	4	5-11	8.00	2.58	82-101	85.50	4.43
Wayland Temple Baptist							
Male	6	5-10	7.50	2.03	72-105	81.66	13.49
Female	8	5-12	9.00	1.98	76-103	85.12	7.94
Zoar Methodist							
Male	5	7-12	9.80	1.92	80-111	94.20	12.64
Female	5	5-12	7.80	2.77	52-96	80.20	16.19
Philadelphia							
Male	74	4-16	8.15	2.54	67-139	90.37	12.79
Female	76	2-16	8.81	2.61	52-114	89.06	12.16
Total Philadelphia	150	2-16	8.49	2.59	52-139	89.70	12.45

Table 7

WPPSI Performance Scores

Final Testing (Spring 1969)

Philadelphia N=133

Head Start Centers	Number of Pupils	Animal House			Performance IQ		
		Range of Scaled Scores	Mean Scaled Scores	SD	Range	Mean	SD
Annunciation							
Male	6	3-11	7.33	3.44	64-107	85.17	16.58
Female	5	7-11	9.00	1.87	86-110	97.80	8.64
Berean Presbyterian							
Male	5	6-11	9.80	2.58	84-89	90.60	8.32
Female	7	9-12	10.00	1.00	92-120	99.57	14.24
Emmanuel Institutional							
Male	5	8-15	9.40	3.04	78-103	94.40	13.24
Female	6	8-11	9.33	1.36	74-108	91.83	12.76
First Methodist							
Male	9	7-15	9.77	3.38	81-116	99.77	12.73
Female	5	5-13	11.80	2.16	89-119	108.60	6.69
Janes Methodist							
Male	7	5-17	7.71	4.57	78-135	93.14	20.52
Female	7	5-12	9.28	2.42	73-126	98.57	17.97
Jones Memorial Baptist							
Male	6	7-12	10.00	1.78	70-119	100.50	17.00
Female	4	7-11	9.75	1.89	91-107	96.25	7.36
Jones Tabernacle A.M.E.							
Male	4	9-14	11.00	4.66	85-124	107.50	17.40
Female	5	6-15	9.80	3.70	82-112	98.60	11.86
New Salem Baptist							
Male	5	8-13	10.60	2.51	92-110	102.80	7.15
Female	5	5-10	7.40	2.40	69-118	89.00	20.55
Open Door Baptist							
Male	6	6-13	9.16	2.48	76-114	93.33	16.53
Female	7	6-13	9.57	2.76	77-100	90.85	7.71
St. Paul's Baptist							
Male	5	8-11	8.20	2.17	78-105	94.60	11.37
Female	4	5-12	10.50	1.29	89-100	94.75	5.56
Wayland Temple Baptist							
Male	5	6-11	8.60	1.82	74-104	87.60	11.89
Female	7	8-13	9.57	2.07	80-105	87.86	10.24
Zoar Methodist							
Male	4	9-12	10.25	1.25	91-118	102.00	11.63
Female	4	3-13	8.75	4.35	74-100	89.00	10.86
Philadelphia							
Male	67	3-17	9.24	2.86	64-135	95.70	14.59
Female	66	3-15	9.56	2.36	69-126	95.13	12.66
Total Philadelphia	133	3-17	9.39	2.63	64-135	95.42	13.62

Table 8

Preschool Inventory

Initial Data (Fall 1968)

Philadelphia N=148

Head Start Centers	Number of Pupils	Range Right Out of 64	Mean Right	Mean Wrong
Annunciation				
Male	5	13-46	29.2	34.8
Female	6	24-34	29.8	34.2
Berean Presbyterian				
Male	6	11-27	21.5	42.5
Female	8	21-42	33.9	30.1
Emmanuel Institutional Baptist				
Male	6	16-35	26.7	37.3
Female	6	21-39	30.8	33.2
First Methodist				
Male	9	20-47	37.7	26.3
Female	6	23-49	39.5	24.5
Janes Methodist				
Male	7	33-43	38.1	25.9
Female	7	34-42	39.0	25.0
Jones Memorial Baptist				
Male	7	23-42	32.9	31.1
Female	5	19-30	26.6	37.4
Jones Tabernacle A.M.E.				
Male	4	19-25	22.3	41.8
Female	8	15-45	31.6	32.4
New Salem Baptist				
Male	6	32-38	35.8	28.2
Female	5	23-47	30.6	33.4
Open Door Baptist				
Male	7	13-51	29.1	34.9
Female	7	12-39	27.4	36.6
St. Paul's Baptist				
Male	5	22-42	30.0	34.0
Female	5	13-39	28.8	35.2
Wayland Temple Baptist				
Male	6	18-29	23.8	40.2
Female	8	21-40	27.6	36.4
Zoar Methodist				
Male	4	34-41	37.5	26.5
Female	5	24-39	33.6	30.4
Philadelphia				
Male	72	11-51	30.4	33.7
Female	76	12-49	31.6	32.4
Total Philadelphia	148	11-51	31.0	33.1

Table 9

Preschool Inventory

Final Data (Spring 1969)

Philadelphia N=130

Head Start Centers	Number of Pupils	Range Right Out of 64	Mean Right	Mean Wrong
Annunciation				
Male	5	15-44	32.16	27.83
Female	6	33-45	39.40	23.40
Berean Presbyterian				
Male	4	25-42	35.75	25.75
Female	8	24-50	42.12	21.38
Emmanuel Institutional Baptist				
Male	6	26-49	41.00	21.50
Female	5	32-55	36.00	18.40
First Methodist				
Male	9	35-53	46.00	19.75
Female	5	39-57	51.60	12.00
Janes Methodist				
Male	7	44-60	49.85	12.14
Female	7	42-53	48.57	14.86
Jones Memorial Baptist				
Male	6	27-50	43.00	20.66
Female	4	28-43	35.50	28.25
Jones Tabernacle A.M.E.				
Male	4	30-43	37.00	26.25
Female	5	35-46	41.20	21.80
New Salem Baptist				
Male	5	33-49	41.20	21.80
Female	5	23-51	37.00	21.60
Open Door Baptist				
Male	6	21-49	36.33	25.83
Female	6	23-45	35.66	28.66
St. Paul's Baptist				
Male	4	21-47	38.50	25.25
Female	3	31-57	39.67	20.00
Wayland Temple Baptist				
Male	5	23-41	24.20	29.00
Female	7	27-49	38.00	28.00
Zoar Methodist				
Male	4	43-51	46.50	16.50
Female	4	28-48	36.75	26.25
Philadelphia				
Male	65	15-60	40.06	22.14
Female	65	23-57	38.92	22.01
Total Philadelphia	130	15-60	39.49	22.07

Table 10

Illinois Test of Psycholinguistic Abilities

Initial Data (Fall 1968)

Philadelphia N=148

Head Start Centers	Number of Pupils	Scaled Scores					
		Auditory Reception			Visual Reception		
		Range	Mean	SD	Range	Mean	SD
Annunciation							
Male	6	25-38	31.16	5.26	26-42	33.33	5.78
Female	6	28-36	32.66	3.55	28-38	33.16	3.92
Berean Presbyterian							
Male	4	28-36	31.75	3.30	33-39	35.25	2.63
Female	8	27-40	34.13	5.17	30-45	35.13	4.76
Emmanual Institutional Baptist							
Male	6	24-38	32.00	4.86	38-47	42.83	3.87
Female	6	27-37	32.66	3.72	30-45	38.83	5.53
First Methodist							
Male	9	25-41	34.00	6.00	32-47	40.77	5.31
Female	6	26-38	34.33	4.84	34-47	40.33	4.59
Janes Methodist							
Male	7	32-40	35.00	3.00	33-42	36.57	4.04
Female	7	32-39	35.42	2.76	33-44	38.00	4.58
Jones Memorial Baptist							
Male	7	39-62	47.00	8.92	26-44	33.57	6.13
Female	5	31-47	39.00	6.20	28-42	33.20	5.35
Jones Tabernacle A.M.E.							
Male	4	24-38	31.25	5.73	29-50	39.25	8.62
Female	8	24-50	30.50	14.46	30-45	34.75	15.18
New Salem Baptist							
Male	6	26-39	31.50	5.47	27-40	35.00	4.73
Female	5	25-34	28.80	4.09	27-38	33.60	5.18
Open Door Baptist							
Male	7	24-42	33.57	6.55	25-52	37.28	9.14
Female	8	24-37	27.12	11.69	23-40	27.87	12.29
St. Paul's Baptist							
Male	5	27-36	30.60	4.50	26-45	38.20	7.29
Female	5	22-40	31.00	8.77	32-40	36.60	2.96
Wayland Temple Baptist							
Male	6	26-37	26.50	13.50	29-37	27.16	13.64
Female	8	22-43	31.50	6.84	24-38	33-62	4.30
Zoar Methodist							
Male	4	29-38	35.75	4.50	33-42	38.50	4.36
Female	5	30-36	33.80	2.68	29-40	35.20	4.32
Philadelphia							
Male	71	24-62	32.65	4.79	25-52	37.51	6.05
Female	77	22-50	32.63	5.25	23-47	36.08	5.17
Total Philadelphia	148	22-62	32.64	5.02	23-52	36.77	5.64

Table 10

Illinois Test of Psycholinguistic Abilities

Initial Data (Fall 1968)

Philadelphia N=148

Head Start Centers	Number of Pupils	Scaled Scores					
		Auditory Sequencing			Visual Sequencing		
		Range	Mean	SD	Range	Mean	SD
Annunciation							
Male	6	20-45	31.83	10.02	30-43	37.00	4.47
Female	6	30-49	37.50	6.71	27-45	37.83	6.27
Berean Presbyterian							
Male	4	34-52	39.25	8.62	31-35	33.00	3.33
Female	8	38-52	44.75	6.09	24-42	31.00	5.78
Emmanuel Institutional Baptist							
Male	6	37-43	39.33	2.07	26-50	33.83	8.47
Female	6	21-46	37.83	9.78	25-44	22.83	13.26
First Methodist							
Male	9	32-54	40.33	6.69	20-47	35.88	8.61
Female	6	32-53	43.66	8.98	27-38	34.16	4.16
Janes Methodist							
Male	7	34-51	41.28	6.62	26-48	34.00	8.87
Female	7	33-50	41.14	6.66	25-44	34.25	6.21
Jones Memorial Baptist							
Male	7	28-37	32.14	3.53	32-49	38.42	5.97
Female	5	28-32	29.40	1.67	33-41	37.60	3.78
Jones Tabernacle A.M.E.							
Male	4	29-47	41.00	8.12	31-38	35.25	3.40
Female	8	36-59	42.00	18.73	32-49	33.25	14.84
New Salem Baptist							
Male	6	33-66	43.33	12.40	27-44	35.66	6.56
Female	5	33-55	40.40	8.91	22-38	28.60	6.77
Open Door Baptist							
Male	7	38-52	41.85	5.08	24-40	28.57	5.62
Female	8	34-42	33.75	14.09	23-43	26.13	12.47
St. Paul's Baptist							
Male	5	35-48	39.80	4.86	23-41	30.80	7.75
Female	5	41-62	46.40	8.96	31-43	35.20	4.91
Wayland Temple Baptist							
Male	6	31-60	37.83	21.33	27-40	27.16	14.11
Female	8	25-49	41.00	7.32	19-41	31.87	8.16
Zoar Methodist							
Male	4	35-56	45.50	9.32	33-44	37.50	5.45
Female	5	31-51	42.40	8.29	35-47	39.00	4.74
Philadelphia							
Male	71	20-66	41.28	8.42	20-50	33.93	6.67
Female	77	21-59	41.80	7.71	19-49	32.89	7.83
Total Philadelphia	148	20-66	41.55	8.04	19-50	33.39	7.28

Table 11

Illinois Test of Psycholinguistic Abilities

Final Data (Spring 1969)

Philadelphia N=129

Head Start Centers	Number of Pupils	Scaled Scores					
		Auditory Reception			Visual Reception		
		Range	Mean	SD	Range	Mean	SD
Annunciation							
Male	4	25-38	29.00	6.05	36-51	34.25	5.12
Female	5	29-40	35.00	4.47	29-47	36.60	7.23
Berean Presbyterian							
Male	4	31-35	32.00	2.00	31-38	35.75	3.20
Female	7	27-41	35.00	4.47	26-39	36.60	7.23
Emmanuel Institutional Baptist							
Male	5	25-39	33.80	5.26	38-40	39.20	.83
Female	6	25-43	32.66	7.11	26-46	37.33	7.52
First Methodist							
Male	8	31-43	35.75	3.81	31-46	37.87	4.88
Female	5	33-40	36.00	3.24	37-46	42.80	3.49
Janes Methodist							
Male	7	26-35	32.28	3.09	31-44	36.85	5.92
Female	7	29-45	34.85	6.14	26-46	37.28	6.65
Jones Memorial Baptist							
Male	6	28-38	33.66	3.38	33-52	44.16	7.22
Female	4	27-34	30.25	2.98	39-52	42.75	4.57
Jones Tabernacle A.M.E.							
Male	4	27-35	31.00	4.08	38-49	42.00	4.96
Female	5	28-39	34.20	4.49	32-44	38.60	4.66
New Salem Baptist							
Male	5	34-49	39.60	5.59	27-40	35.20	5.07
Female	5	28-43	33.20	5.80	28-40	34.00	5.09
Open Door Baptist							
Male	6	32-54	38.16	8.06	36-44	39.83	3.31
Female	7	24-37	30.42	4.85	30-43	35.71	4.34
St. Paul's Baptist							
Male	4	26-40	31.25	6.07	34-42	37.50	3.41
Female	4	31-40	35.75	4.42	31-47	40.75	6.94
Wayland Temple Baptist							
Male	5	29-38	34.00	3.87	30-44	35.20	5.54
Female	7	27-43	39.00	14.96	34-43	37.42	4.03
Zoar Methodist							
Male	4	34-41	40.75	7.41	31-37	43.50	18.48
Female	5	28-40	35.60	4.61	31-34	32.80	1.09
Philadelphia							
Male	62	25-54	34.45	5.64	27-52	38.46	6.72
Female	67	24-45	34.37	6.75	26-52	37.29	5.62
Total Philadelphia	129	24-54	34.41	6.22	26-52	37.86	6.18

Table 11

Illinois Test of Psycholinguistic Abilities

Final Data (Spring 1969)

Philadelphia N=129

Head Start Centers	Number of Pupils	Scaled Scores					
		Auditory Sequencing			Visual Sequencing		
		Range	Mean	SD	Range	Mean	SD
Annunciation							
Male	4	19-51	34.00	13.34	20-47	29.50	11.95
Female	5	38-44	39.40	6.80	31-41	35.00	3.81
Berean Presbyterian							
Male	4	31-45	39.75	6.18	31-37	34.75	2.87
Female	7	29-47	39.40	2.60	34-48	35.00	3.80
Emmanuel Institutional Baptist							
Male	5	34-40	37.60	2.51	23-38	31.20	6.87
Female	6	36-54	42.00	6.16	24-31	27.33	3.01
First Methodist							
Male	8	37-47	41.50	4.37	30-40	34.12	3.13
Female	5	33-54	44.00	9.19	28-45	36.20	7.76
Janes Methodist							
Male	7	33-61	47.42	11.35	26-45	37.85	6.56
Female	7	38-56	42.42	5.88	31-51	41.00	6.24
Jones Memorial Baptist							
Male	6	36-54	45.33	6.37	25-50	39.33	9.66
Female	4	36-54	38.75	9.91	32-49	33.50	8.22
Jones Tabernacle A.M.E.							
Male	4	31-57	45.25	10.78	32-54	42.50	9.14
Female	5	39-51	46.40	5.07	33-51	39.80	6.83
New Salem Baptist							
Male	5	34-51	40.80	8.43	22-42	34.20	7.76
Female	5	29-47	39.20	7.22	18-50	30.40	12.03
Open Door Baptist							
Male	6	31-56	40.50	8.82	23-43	31.83	8.22
Female	7	29-43	39.00	9.05	26-42	34.57	5.88
St. Paul's Baptist							
Male	4	34-48	41.25	6.39	30-43	34.25	5.96
Female	4	39-55	46.50	6.76	32-38	34.75	2.50
Wayland Temple Baptist							
Male	5	35-66	45.40	12.05	26-40	32.40	6.22
Female	7	28-57	44.71	18.32	25-44	33.57	6.45
Zoar Methodist							
Male	4	35-60	33.75	24.95	36-46	46.00	10.67
Female	5	27-60	40.40	12.01	32-44	38.00	4.63
Philadelphia							
Male	62	19-66	41.51	10.25	20-54	35.51	8.13
Female	67	27-60	41.86	8.92	18-51	35.58	7.21
Total Philadelphia	129	19-66	41.69	9.54	18-54	35.55	7.63

Table 12

Parent Interview Information

Initial Data (Fall 1968)

Philadelphia N=140

Head Start Centers	Mothers Who Perceived Changes Due to Head Start			Parents Who Read to Their Children			Expectations of Mothers for Their Children's Education				
	% Yes	% None	% No Response	% Often	% Occasionally	% Seldom	% Don't Know	% Jr. High School	% High School	% Vocational	% College
Annunciation	84.6		15.4	72.7	27.3			9.1	54.5		34.4
Berean Presbyterian	70.8	7.6	21.6	50.0	50.0		8.3		75.0	8.3	8.3
Emmanuel Institutional	76.9	7.8	15.3	63.6	36.4		18.2	18.2	45.4		18.2
First Methodist	87.5		12.5	78.6	14.3	7.1	7.1		50.0		42.9
Janes Methodist	75.7		24.3	83.3	16.7		16.7		58.3		25.0
Jones Memorial Baptist	100.0			71.4	14.3	14.3	7.1		42.9	7.1	42.9
Jones Tabernacle A.M.E.	100.0			42.9	42.8	14.3	7.1		64.3	14.3	14.3
New Salem Baptist	63.6	9.2	27.2	62.5	37.5		12.5		75.0	12.5	
Open Door Baptist	93.2		6.8	78.6	21.4				64.3		35.7
St. Paul's Baptist	70.0	30.0		80.0	20.0		10.0	30.0	50.0		10.0
Wayland Temple Baptist	66,6	6.6	26.8	72.7	18.2	9.1	9.1		63.6		27.3
Zoar Methodist	70.0	20.0	10.0	66.7	22.2	11.1			77.8		22.2
Total Philadelphia	79.9	6.7	13.3	68.6	26.8	4.6	8.0	4.8	60.1	3.5	23.6

Table 13

Parent Interview Information

Final Data (Spring 1969)

Philadelphia N=103

Head Start Centers	Mothers Who Perceived Changes Due to Head Start			Parents Who Read to Their Children			Expectations of Mothers for Their Children's Education				
	% Yes	% None	% No Response	% Often	% Occasionally	% Seldom	% Don't Know	% Jr. High School	% High School	% Vocational	% College
Annunciation	100.0			88.8	11.1				44.4		55.5
Berean Presbyterian	100.0			28.6	71.4				100.0		
Emmanuel Institutional	100.0			60.0	10.0	30.0	10.0		80.0		10.0
First Methodist	100.0			75.0	25.0		8.3				91.6
Janes Methodist	100.0			91.6	8.3		8.3		33.3		58.3
Jones Memorial Baptist	100.0			100.0					42.9		57.1
Jones Tabernacle A.M.E.	85.7	14.3		100.0					28.6		71.4
New Salem Baptist	100.0			90.0		10.0			100.0		
Open Door Baptist	90.9	9.1		90.9	9.1				72.7		27.3
St. Paul's Baptist	75.0	25.0		100.0			50.0		50.0		
Wayland Temple Baptist	100.0			72.7	27.3		9.1		63.6		27.3
Zoar Methodist	100.0			100.0			33.3		66.7		
Total Philadelphia	95.9	4.0		83.1	13.5	3.3	9.9		55.9		33.2

Table 14

Parent Interview Information

Philadelphia N=140

Head Start Centers	% Male Models in Home			Educational Level of Parents					
	Natural Father	Adult Male	None	% to 8th Grade		% to 12th Grade		% to College	
				Mother	Father	Mother	Father	Mother	Father
Annunciation	25.0	25.0	50.0	9.1	14.3	90.9	85.7		
Berean Presbyterian	30.0	10.0	60.0	8.3		91.7	100.0		
Emmanuel Institutional Baptist	18.3	36.3	45.4	36.4	37.5	54.5	62.5	9.1	
First Methodist	78.6	7.2	14.2	7.1		71.4	72.7	21.4	27.3
Janes Methodist	70.0	20.0	10.0	8.3		83.3	57.1	8.3	42.9
Jones Memorial Baptist	50.0	16.5	33.5	7.1	9.1	92.9	81.8		9.1
Jones Tabernacle A.M.E.	50.0	14.3	35.7	7.1	22.2	92.9	77.8		
New Salem Baptist	37.5	25.0	37.5			75.0	100.0	25.0	
Open Door Baptist	35.7	35.7	28.6	14.3		85.7	83.3		16.7
St. Paul's Baptist	70.0	10.0	20.0	20.0	33.3	80.0	66.7		
Wayland Temple Baptist	30.0	30.0	40.0	9.1	16.7	90.9	83.3		
Zoar Methodist	62.5	25.0	12.5	11.1	16.7	88.9	83.3		
Total Philadelphia	46.5	21.2	32.3	11.5	12.5	83.2	79.5	5.3	8.0

Table 15

Parent Interview Information

Philadelphia N=140

Head Start Centers	Working Mother			Family Interview						
	% Full Time	% Part Time	% Not Working	% Under $2,000	% $2,000-4,000	% $4,000-6,000	% $6,000-8,000	% $8,000-10,000	% $10,000-14,000	% No Response
Annunciation	18.2	18.2	63.6	9.1	36.4	45.4	9.1			
Berean Presbyterian	16.7	8.3	75.0		41.6	33.3			16.7	8.3
Emmanuel Institutional	27.3	9.1	63.6		54.5	27.3	18.2			
First Methodist	35.7	14.3	50.0		21.4	28.6	28.6		7.1	14.3
Janes Methodist	16.7	8.3	75.0		33.3	33.3	8.3	16.7		8.3
Jones Memorial Baptist	57.1		42.9	7.1	21.4	28.6	21.4	14.3	7.1	
Jones Tabernacle A.M.E.	42.9	14.3	42.9		35.7	35.7	21.4			
New Salem Baptist			100.0		50.0	37.5	12.5			
Open Door Baptist	28.6		71.4	14.3	28.6	35.7	14.3			7.1
St. Paul's Baptist	30.0		70.0	10.0	30.0	50.0	10.0			
Wayland Temple Baptist	18.2	9.1	72.7	9.1	36.4	54.5				
Zoar Methodist	33.3		66.7		33.3	44.4		22.2		
Total Philadelphia	27.0	6.8	66.2	4.1	35.2	37.9	12.0	4.4	3.2	3.2

Table 16

The Play Situation--Picture Board Sociometric Technique

Initial Data (Fall 1968)

Children's Peer Choices in Play Situations

Philadelphia N=137

Head Start Centers	Number of Pupils	Peer Choices in Five Play Situations			Peer Choices for Most Desirable Playmate		
		Same Sex Peers	Opposite Sex Peers	Total Choices	Same Sex Peers	Opposite Sex Peers	Total Choices
Annunciation							
Male	6	18	7	25	5	1	6
Female	5	5	1	6	3	2	5
Berean Presbyterian							
Male	5	6	3	9	3	2	5
Female	8	19	4	23	8	0	8
Emmanuel Institutional							
Male	4	8	0	8	3	1	4
Female	8	16	7	23	7	1	8
First Methodist							
Male	8	8	4	12	6	2	8
Female	6	6	2	8	4	2	6
Janes Methodist							
Male	7	13	4	17	5	2	7
Female	7	14	10	24	6	1	7
Jones Memorial Baptist							
Male	6	8	4	12	2	4	6
Female	5	5	4	9	3	2	5

(Table continued on next page)

Table 16 (continued)

Head Start Centers	Number of Pupils	Peer Choices in Five Play Situations			Peer Choices for Most Desirable Playmate		
		Same Sex Peers	Opposite Sex Peers	Total Choices	Same Sex Peers	Opposite Sex Peers	Total Choices
Jones Tabernacle A.M.E.							
Male	4	10	4	14	3	1	4
Female	6	14	2	16	6	0	6
New Salem Baptist							
Male	6	13	8	21	4	2	6
Female	5	3	4	7	3	2	5
Open Door Baptist							
Male	5	4	2	6	2	3	5
Female	6	8	7	15	3	3	6
St. Paul's Baptist							
Male	5	9	1	10	4	1	5
Female	5	13	5	18	4	1	5
Wayland Temple Baptist							
Male	5	7	5	12	4	1	5
Female	7	10	3	13	5	2	7
Zoar Methodist							
Male	4	9	6	15	4	0	4
Female	4	5	1	6	2	2	4
Total Philadelphia	137	231	98	329	99	38	137

Table 17

The Play Situation--Picture Board Sociometric Technique

Final Data (Spring 1969)

Children's Peer Choices in Play Situations

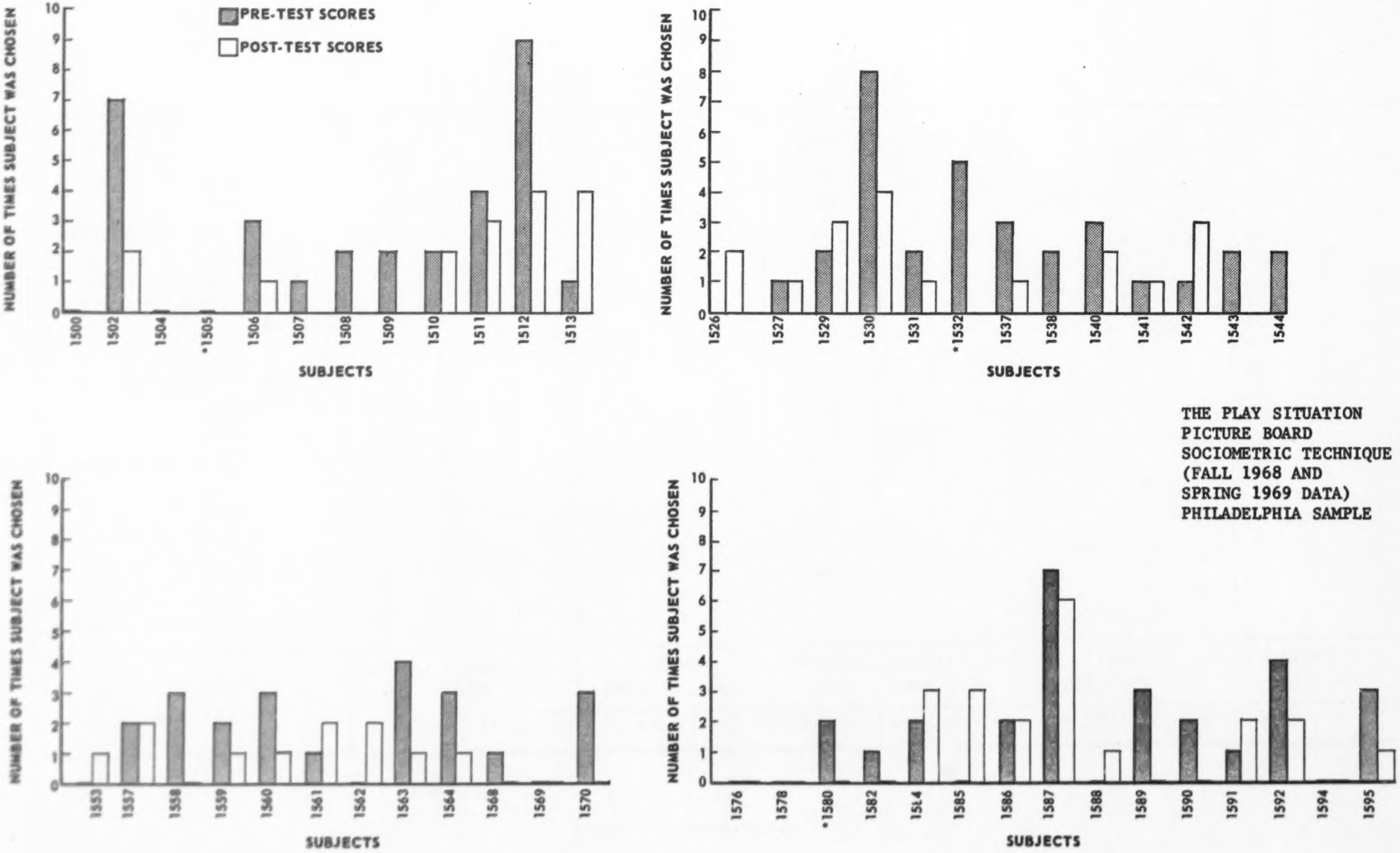
Philadelphia N=135

Head Start Centers	Number of Pupils	Peer Choices in Five Play Situations			Peer Choices for Most Desirable Playmate		
		Same Sex Peers	Opposite Sex Peers	Total Choices	Same Sex Peers	Opposite Sex Peers	Total Choices
Annunciation							
Male	6	13	1	14	5	1	6
Female	5	7	3	10	4	1	5
Berean Presbyterian							
Male	4	9	4	13	4	0	4
Female	7	16	4	20	5	2	7
Emmanuel Institutional							
Male	5	7	4	11	4	1	5
Female	8	13	11	24	5	3	8
First Methodist							
Male	10	21	6	27	7	3	10
Female	5	8	11	19	4	1	5
Janes Methodist							
Male	7	14	10	24	4	3	7
Female	7	11	9	20	4	3	7
Jones Memorial Baptist							
Male	6	11	8	19	3	3	6
Female	4	10	9	19	4	0	4

(Table continued on next page)

Table 17 (continued)

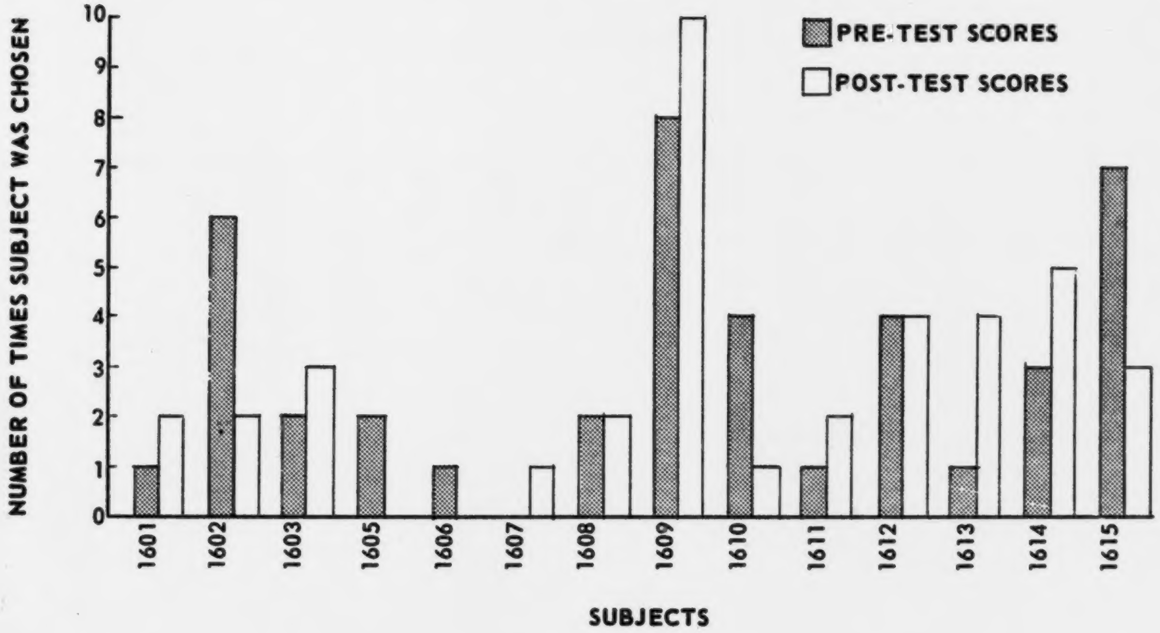
Head Start Centers	Number of Pupils	Peer Choices in Five Play Situations			Peer Choices for Most Desirable Playmate		
		Same Sex Peers	Opposite Sex Peers	Total Choices	Same Sex Peers	Opposite Sex Peers	Total Choices
Jones Tabernacle A.M.E.							
Male	4	7	2	9	4	0	4
Female	6	12	4	16	4	2	6
New Salem Baptist							
Male	5	8	8	16	4	1	5
Female	5	9	8	17	3	2	5
Open Door Baptist							
Male	5	10	2	12	4	1	5
Female	7	17	1	18	3	4	7
St. Paul's Baptist							
Male	4	20	1	21	4	0	4
Female	4	14	3	17	4	0	4
Wayland Temple Baptist							
Male	6	17	3	20	4	2	6
Female	7	18	7	25	7	0	7
Zoar Methodist							
Male	5	14	9	23	4	1	5
Female	3	5	3	8	2	1	3
Total Philadelphia	135	291	131	422	100	35	135

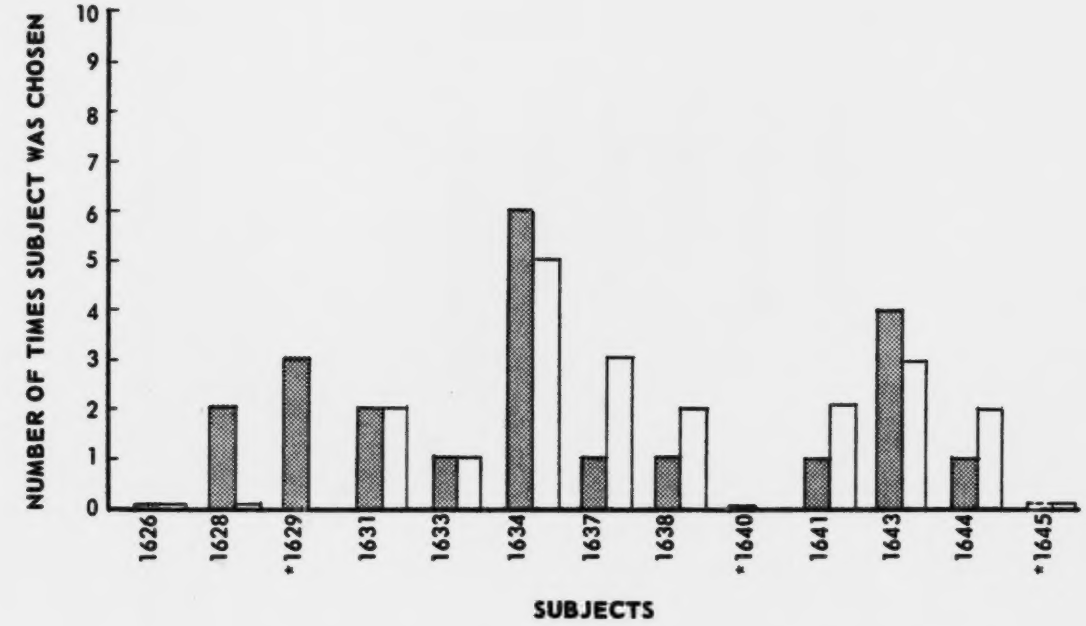


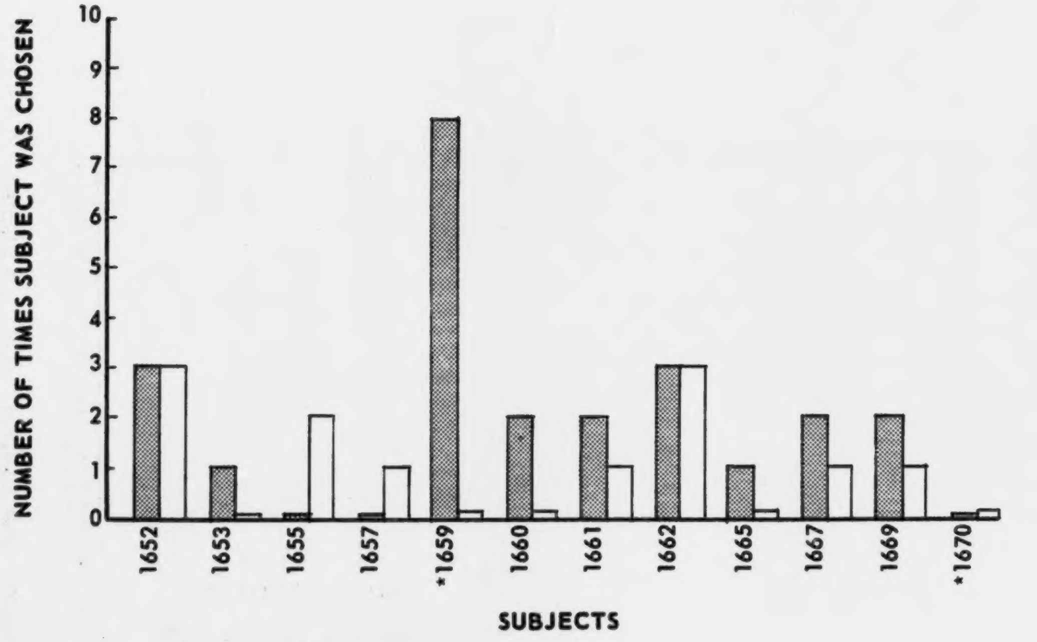
THE PLAY SITUATION
PICTURE BOARD
SOCIOMETRIC TECHNIQUE
(FALL 1968 AND
SPRING 1969 DATA)
PHILADELPHIA SAMPLE

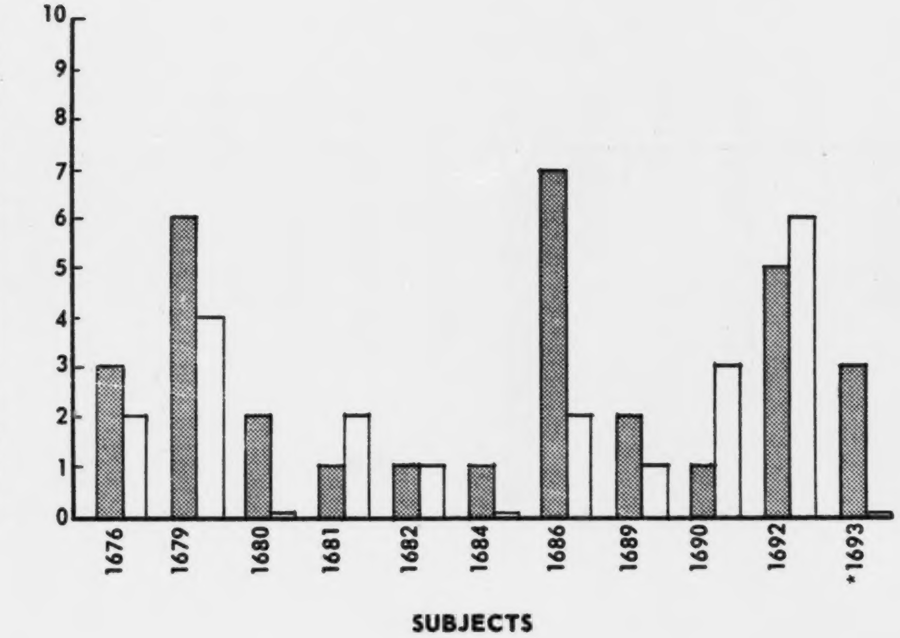
*DROPPED FROM SAMPLE AFTER PRE-TESTING

2

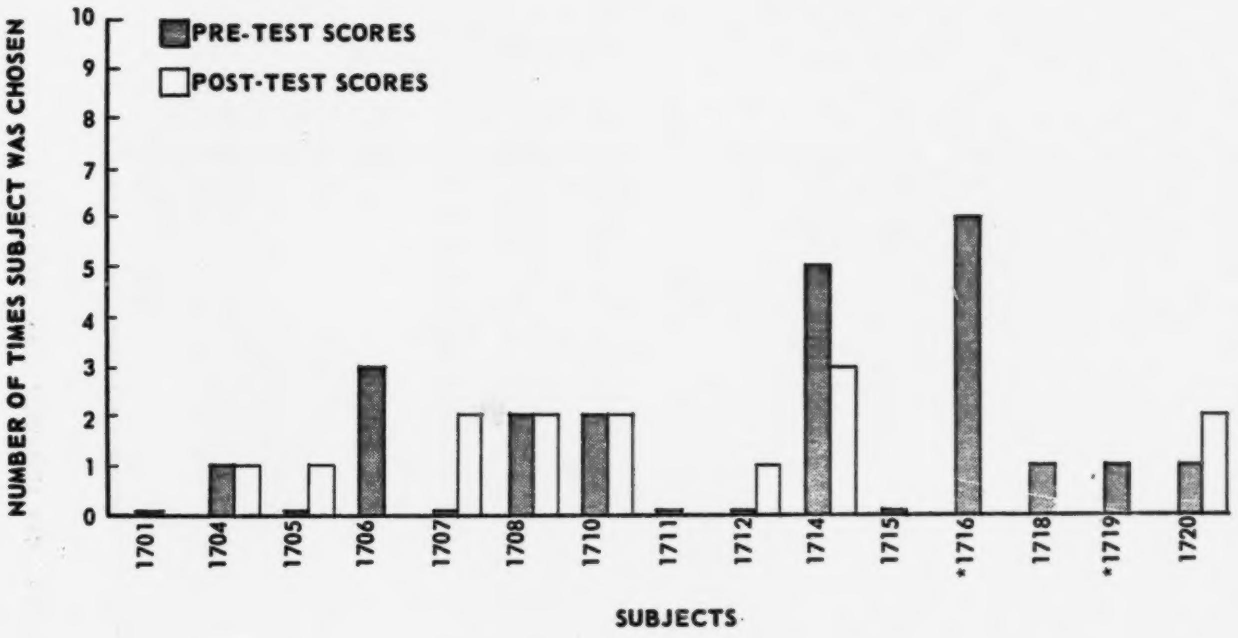


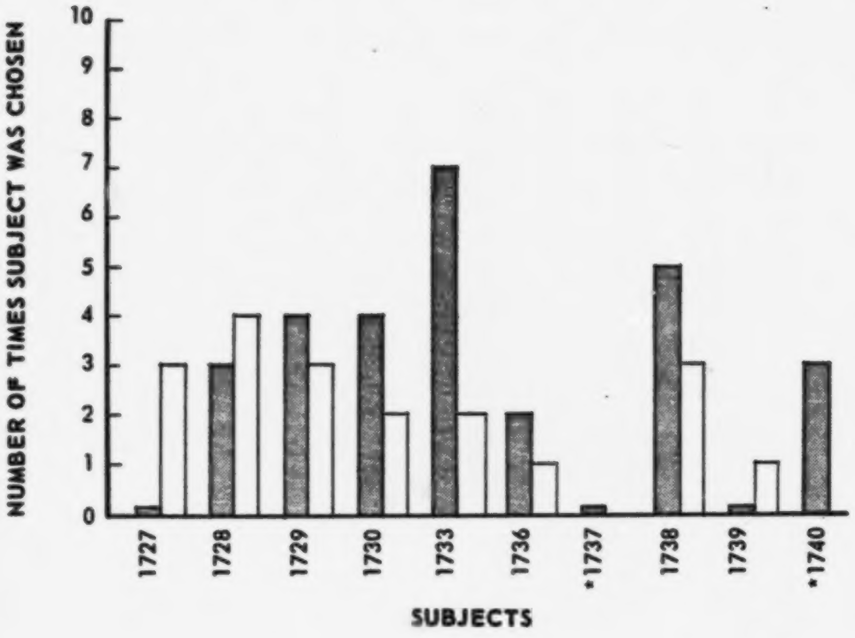


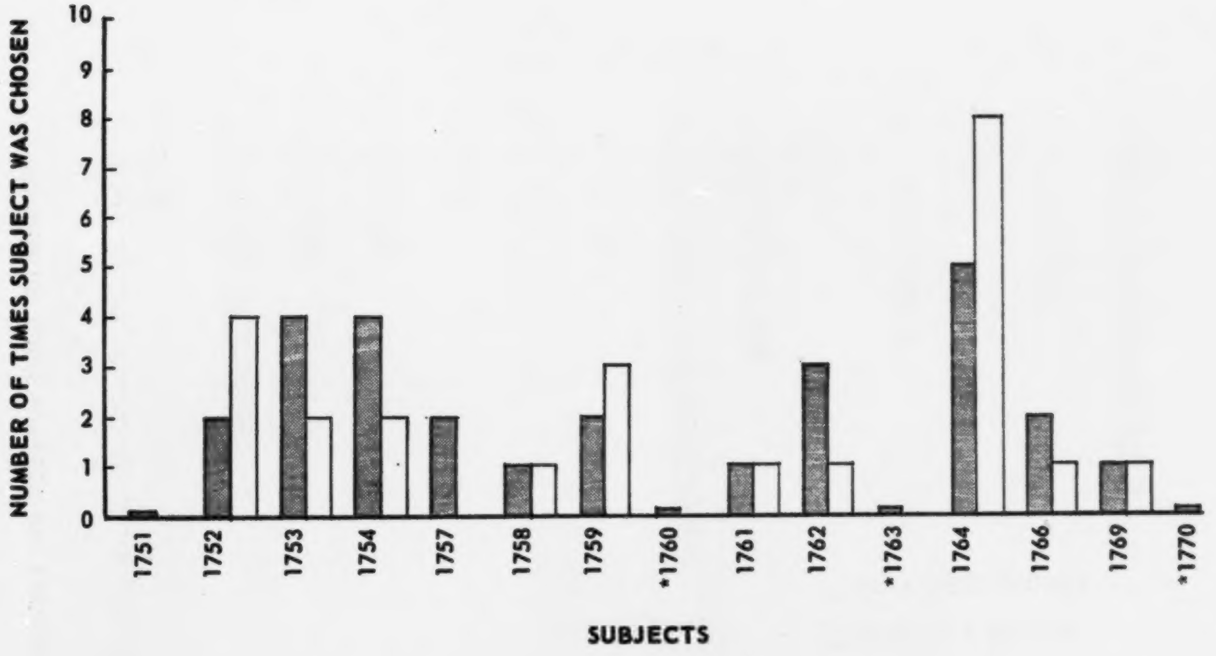


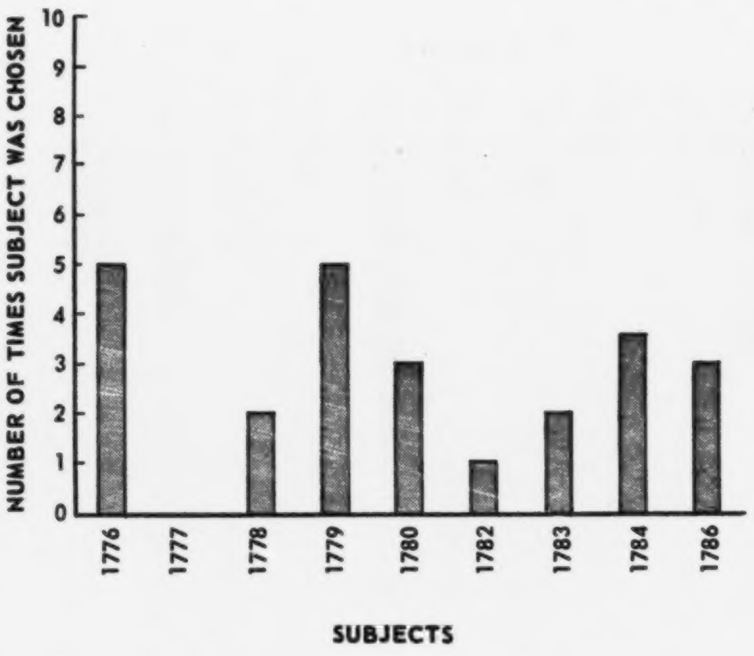


*DROPPED FROM SAMPLE AFTER PRE-TESTING.









*DROPPED FROM SAMPLE AFTER PRE-TESTING

Table 18

Characteristics of Teaching Staff

Appalachia Follow Up

Follow Up Site	Age					Educational Level Attained			Years of Teaching	Resident of School Zone	
	19-27	28-39	40+	Negro	White	High School	College	Credit Beyond B.A.		Yes	No
Kentucky											
New Bethel		X			X			X	11	X	
Boone Height											
Teacher 1			X		X		X		26		X
Teacher 2			X		X		X		48		X
Teacher 3			X	X				X	26	X	
Barbourville City			X		X		X		19	X	
Cannon Early Childhood Center		X			X	X			4		X
Rosenwald Boone Early Childhood	X			X			X		4	X	

(Table continued on next page)

Table 18 (continued)

Follow Up Site	Age					Educational Level Attained			Years of Teaching	Resident of School Zone	
	19-27	28-39	40+	Negro	White	High School	College	Credit Beyond B.A.		Yes	No
West Virginia											
Flemington Elementary											
Teacher 1			X		X		X		41	X	
Teacher 2			X		X			X	41	X	
Tennessee											
Carter's Valley	X				X		X		1		X
Church Hill Elementary		X			X		X		8	X	
Liberty Hill			X		X		X		30		X
McPheeter's Bend		X			X		X		17	X	
Surgoinsville Elementary			X		X		X		33		X

Table 19

Age Range of Sample Children in Months

(Spring 1969)

Appalachia Follow Up N=39

Follow Up Sites	54-59	60-65	66-71	72-77	78-83	84-89	90-95
Barbourville (Kentucky)							
Male	2	0	0	0	2	3	0
Female	1	1	0	4	4	4	0
Simpson (West Virginia)							
Male	0	0	0	0	0	3	0
Female	0	0	0	0	3	3	1
New Canton (Tennessee)							
Male	0	0	0	0	3	0	0
Female	0	0	0	2	0	3	0
Appalachia							
Male	2	0	0	0	5	6	0
Female	1	1	0	6	7	10	1
Total Appalachia	3	1	0	6	12	16	1

Table 20

Family Information

(Spring 1969)

Appalachia Follow Up N=39

Follow Up Sites	Number of Pupils	Siblings at Home (under 18)		Adults in Home				Educational Level of Parents by Grade							
								Mother				Father			
		Mean	Range	Mother Only	Father Only	Mother & Father	Other	1-6	7-11	12th	unknown	1-6	7-11	12th	unknown
Kentucky	21	4.0	0-9	2	0	18	1	1	9	6	4	6	5	3	4
West Virginia	10	4.2	0-10	1	1	5	3	3	3	2	0	2	2	1	1
Tennessee	8	3.4	0-7	2	0	6	1	1	3	2	2	2	3	0	1
Total Appalachia	39	3.9	0-10	5	1	29	5	5	15	10	6	10	10	4	6

Data Gathering Techniques

Follow-up

1968-1969

The Stanford-Binet Intelligence Scale

The Binet was administered during the Spring to the follow-up sample to determine whether IQ changes found in the previous year remained stable.

A description of the test can be found on page 21.

Wechsler Pre-school and Primary Scale of Intelligence (WPPSI)

The WPPSI was administered to those follow-up sample children who were still in a pre-kindergarten program during the school year 1968-1969.

In addition to the performance items described on pages 25 and 26, the following verbal items were administered:

Information

The Information Test requires the child to answer questions of general information.

Vocabulary

The Vocabulary Test is composed of a number of words which the child must define.

Arithmetic

The Arithmetic test requires the child to identify relative dimensions and to count at a lower level, and to solve word problems at a higher level.

Similarities

The Similarities Test consists of identifying similarities in pairs of words.

Comprehension

The Comprehension Test contains items which measure the child's level of socialization.

Wechsler Intelligence Scale For Children (WISC)

WISC was part of a battery of tests administered to first grade children in Appalachia, whom we had studied the year before when they were attending Head Start Classes.

This test is designed for children of ages 5 to 15 years and consists of twelve tests which are divided into two subgroups identified as Verbal and Performance. However, these tests tap other factors, some non-intellective, that are equally important in evaluating the individual's performance.

In the verbal section the child is required to give general information of a practical nature; deal with arithmetic problems and show his understanding of similarities, analogies and vocabulary.

The performance section contains a picture completion test; a test which presents the child with picture-cards and asks him to arrange them in such a way that they tell a story; a block design test; an object assembly test, which resembles simple puzzles that the child must put together and finally a coding test in which the child is required to associate geometric figures with specific signs.

The amount of time necessary for completing each item is an important factor in evaluating the child's performance.

Gumpgookies

The Gumpgookies was administered to all follow-up sample children. A description of it can be found on page 21

A Study of the Effects of Head Start in Appalachia

Follow-up*

A. Introduction

An important question has been asked about the efficacy of pre-school experience for disadvantaged children. It is: Does the experience provide benefit which lasts over into the regular school year? One way of obtaining information in reference to this question would be to use a standardized test such as the Stanford-Binet. It could be administered or data could be obtained in the fall and then in the spring of one year and if evidence of gain were found then the children might again be tested after their first year in regular school (spring of the following year) to see if they had maintained their improvement during their work in first grade. Such a study was undertaken by further testing of children in the Spring of 1969 who had been tested in the Fall of 1967, in the Spring of 1968.

While such information is important it should be remembered that a child continuing to live in adverse circumstances in his home or who goes to an inadequate school could hardly be expected to maintain his progress. On the other hand if effort is made to improve his living conditions and his health, and he attends an adequate school he might be expected to maintain the progress achieved in the Head Start year. The question asked then in this study is: Did the disadvantaged children in Appalachia continue their gain made in Head Start during their first year of school?

---

*This report concerns the use of the Stanford-Binet. Data with other measures, however, were collected and are also presented in tabular form.

B. Method

Subjects

In the follow-up study there were 39 children, 13 boys and 26 girls. The areas from which they came are described below.

Barbourville, Kentucky

Barbourville, a town with a population of 3,200 is located in Knox County, Kentucky in the southeastern part of the state. This area, which at one time had a thriving mining and lumbering business, now has only one saw mill which runs at full capacity at infrequent intervals. There still is one textile plant. The only other source of employment for unskilled labor is a federal program which provides a small number of jobs. Many of the people live on welfare and most young people leave the area when they reach an employable age.

The sample of children involved in the follow-up attended three public schools: Barbourville City School, Boone Height School, New Bethel School, and two Head Start Centers: Rosenwald Center and Cannon Center. The public schools are located in or near the city of Barbourville. The two Head Start Centers are located in small buildings in rural areas and are sponsored by the Knox County Economic Opportunity Council. Most of the children are Caucasian.

Barbourville City School

The Barbourville City School is located in a residential area. The school has grades one to twelve. Grades one through eight are housed in a new wing that has been added in the last six years. There is a summer program for children in the first eight grades that provides for academic enrichment as well as instruction in arts and crafts. All special services, health, dental, psychological and guidance are provided on a part time basis. There is a cafeteria which provides a program of hot lunches and snacks. The school also provides a free milk program.

New Bethel School

New Bethel School is a public institution located in a little town outside of Barbourville. The school houses grades one through eight. The building itself was constructed about 50 years ago. Although the school does not have a cafeteria, hot lunches are provided for all children and are usually served in the auditorium which also is used as a gymnasium. A summer school program is provided for pre-school children.

Boone Height School

Boone Height School is a public institution located on the outskirts of Barbourville. The school building is only two years old and houses grades one through eight. There is a special service section which includes a full-time remedial reading teacher and part-time psychologist. The school provides a regular testing program for all students and a special reading project for students in need of this type of instruction. A free hot lunch is served to all children.

Rosenwald Center

The Rosenwald Center is on state highway about five miles from Barbourville. The building used for the classes is very old and has limited heating facilities. It has classrooms, kitchen, and office space. There are adequate play facilities outdoors and enough space for physical exercise. Snacks and lunches are provided.

Cannon Center

Cannon Center is located on a county road in a rural area of Knox County. The Center serves children from remote mountain areas. The children attend half-day sessions and have a hot lunch and snacks during their stay. There is a large play area across the street from the Center.

Certain teaching devices like tape recorders and movie projectors are available upon request. A nurse and social worker visit the Center on a part-time basis.

Flemington, West Virginia* (Number of pupils = 10)

Flemington, West Virginia is a rural area with little industry and a small population. There is one high school for grades 7 to 12 and one grade school for grades 1 to 6 in the area, which accommodate many of the children from the surrounding localities such as Simpson and Grafton. The majority of the children are Caucasian.

Flemington Grade School

The Grade School, which the sample attend, is an old, two-story brick building with approximately six classrooms on each floor. The younger children are located on the first floor and the older children on the second.

The staff consists of ten teachers for approximately 300 children and in addition there is a part-time music teacher and speech therapist who visit the school on a weekly basis.

---

*Subjects last year went to Simpson Center.

Church Hill, Tennessee (Number of pupils = 8) (New Canton)

This area is a hilly, rural one dotted with small towns, with the exception of Kingsport which is the hub of the area's commercial activities. There is one large industrial plant in Kingsport which offers employment to many people but the primary means of livelihood for most people is either from small business or small farms.

There were eight children in five different elementary schools evaluated in the follow-up study. All the schools are located outside of Kingsport in the country and thus most of the children are dependent on buses for transportation to the schools. The majority of children in these schools are Caucasian; the Negro children constitute below 1% of the population.

Church Hill Elementary School

Church Hill Elementary School is a recently constructed building of concrete block. There are eight grade levels in this school. The halls are spacious and the classrooms are large with many windows. The school has an auditorium, a library, a gymnasium, and an infirmary, besides a great deal of outdoor space which allows the children plenty of room for free play. The school provides part-time services of an art teacher, speech therapist, and nurse. There is a cafeteria where free hot lunches are served. Free milk is available.

Carter's Valley School

Carter's Valley School is a small elementary school situated far out in the country. It was built between eleven and twenty years ago and has eight grades. The school offers summer programs for classes through sixth grade. There is a cafeteria where free lunches are available. The school also has the facilities of an infirmary, a library, and much space for outdoor play. There are part-time services of a music teacher, an art teacher, a librarian, and a nurse.

Surgoinsville Elementary School

Surgoinsville Elementary School is a large school of fairly recent construction housing seven regular grades, a kindergarten, and five special education classes. The school has a cafeteria, an infirmary, a library, a gymnasium, and outdoor space for recreational activities. A free lunch is provided along with free milk. The school has the services of a full-time librarian, music teacher, a part-time art teacher, and nurse.

McPheeter's Bend Elementary School

McPheeter's Bend Elementary School is a small recently constructed school with eight grade levels. The school offers a summer reading program for grades five through eight.

Hot lunches and milk are provided for the children under a free lunch program. There is a cafeteria, an infirmary, and a library for the pupils' use. Outside of the regular staff there is a part-time nurse and a full-time librarian.

Liberty Hill Elementary School

Liberty Hill Elementary School is a school of moderate size located in a residential area. Although the school is not new a wing has been added which houses several of the classes. The school serves free lunch and milk. Meals are served in the cafeteria. There is a library with a full-time librarian and an infirmary for the children. There also is a gymnasium and outdoor space for the children's physical activities.

C. Results

In the Fall of 1967 at the beginning of the Head Start experience the children had a mean IQ of 84.20. By the end of the Head Start year the children had an IQ of 91.79. There was virtually little difference between boys and girls. Information by Head Start Centers is shown in Tables 2 and 3. After their year in first grade the mean IQ of the children was 94.60. A breakdown by centers is shown in Table 4 and a summarizing table of the testing is shown in Table 5. Other data gathered which were not a part of the study are shown in subsequent tables.

D. Discussion

It can be seen from Table 5 that between the Fall of 1967 and the Spring of 1969 there was an increase of 10 points in IQ. It also can be seen that the children did in fact maintain the gain made during the Head Start year. While the increase is not spectacular and statistical significance is open to question, it should be recognized that the children did improve in meeting the tasks of the test and that this improvement was maintained. It is also of interest to know that little sex difference was encountered.

Many investigators have maintained that such studies can only be interpreted on the basis of trends, but at least the trend in evidence here is encouraging.

Table 1

Number of Sample Children by Sex

Appalachia Follow-up (N=39)

Follow-up Sites	White	Negro
Barbourville (Kentucky)		
Male	6	1
Female	13	1
Total Barbourville	19	2
New Canton (Tennessee)		
Male	2	1
Female	4	1
Total New Canton	6	2
Simpson, West Virginia		
Male	3	0
Female	7	0
Total Simpson	10	0
Total Appalachia		
Male	11	2
Female	24	2
Total Appalachia	35	4

Table 2

Stanford-Binet Intelligence Scores

Appalachia (Fall

Head Start Center	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Barbourville (Kentucky)				
Male	5	75-93	84.00	7.48
Female	13	71-126	88.31	14.52
Total Barbourville	18	71-126	87.11	12.88
New Canton (Tennessee)				
Male	4	85-99	91.25	5.32
Female	4	74-94	83.25	8.22
Total New Canton	8	74-99	87.25	7.70
Simpson, West Virginia				
Male	3	52-86	69.33	17.01
Female	6	60-96	78.83	15.72
Total Simpson	9	52-96	75.66	15.79
Total Appalachia				
Male	12	52-99	82.75	12.52
Female	23	60-126	84.96	14.06
Total Appalachia	35	52-126	84.20	13.41

Table 3

Stanford-Binet Intelligence Scores

Appalachia (Spring 1968)

Head Start Centers	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Barbourville (Kentucky)				
Male	6	82-116	93.83	13.44
Female	11	79-119	95.00	12.39
Total Barbourville	17	79-119	94.59	12.35
New Canton (Tennessee)				
Male	1	97	-	-
Female	3	74-125	96.67	25.97
Total New Canton	4	74-125	96.75	21.20
Simpson (West Virginia)				
Male	2	81-93	87.00	8.49
Female	6	61-100	82.17	15.14
Total Simpson	8	61-100	83.38	13.38
Total Appalachia				
Male	9	81-116	92.67	11.54
Female	20	61-125	91.40	15.84
Total Appalachia	29	61-125	91.79	14.45

Table 4

Stanford-Binet Intelligence Scores

Appalachia (Spring 1969)

Follow-up (N=38)

Follow-up Site Centers	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Barbourville (Kentucky)				
Male	7	83-117	100.36	11.46
Female	13	81-117	99.50	10.63
Total Barbourville	20	81-117	100.00	10.80
New Canton (Tennessee)				
Male	3	80-112	92.33	17.21
Female	5	78-118	92.40	17.44
Total New Canton	8	78-118	92.38	16.08
Simpson, West Virginia				
Male	3	68-92	79.00	12.12
Female	7	70-106	88.43	15.51
Total Simpson	10	68-106	85.60	14.62
Total Appalachia				
Male	13	68-117	94.00	14.02
Female	25	70-118	95.00	14.50
Total Appalachia	38	68-118	94.60	14.13

Table 5

Summary of Stanford-Binet

Appalachia Initial and Follow-up Data

Testing	Number of Pupils	Intelligence Scores		
		IQ range	Mean	SD
Fall, 1967				
Male	12	52-99	82.75	12.52
Female	23	60-126	84.96	14.06
Total Fall, 1967	35	52-126	84.20	13.41
Spring, 1968				
Male	9	81-116	92.67	11.54
Female	20	61-125	91.40	15.84
Total Spring, 1968	29	61-125	91.79	14.44
Spring, 1969				
Male	13	68-117	94.00	14.02
Female	25	70-118	95.00	14.50
Total Spring, 1969	38	68-118	94.60	14.12

Table 6

WISC Follow-up (Spring 1969)

Appalachia (N=31)

Intelligence Scores

Follow-up Site Centers	Number of Pupils	Verbal			Performance			Total IQ		
		Range	Mean	SD	Range	Mean	SD	Range	Mean	SD
Barbourville (Ky.)										
Male	6	87-118	104.00	17.85	74-129	103.40	20.57	87-119	102.50	13.75
Female	7	80-119	97.42	15.37	80-114	98.85	13.01	80-113	98.14	14.13
Total Barbourville	13	80-118	100.71	13.49	74-129	101.13	13.58	80-119	100.32	13.19
New Canton (Tennessee)										
Male	3	81-96	87.00	7.93	90-113	104.33	12.50	85-103	94.67	9.07
Female	5	76-97	86.60	9.18	74-110	90.20	15.13	79-97	87.00	7.07
Total New Canton	8	76-97	86.75	8.13	74-113	95.50	15.13	79-103	89.87	8.23
Simpson (West Virginia)										
Male	3	61-99	83.67	20.03	68-104	83.67	18.44	61-101	82.00	20.07
Female	7	67-103	90.00	15.96	76-107	84.71	17.96	69-105	86.57	17.25
Total Simpson	10	61-103	88.10	16.37	68-107	84.40	17.05	61-105	85.20	17.11
Total										
Male	12	61-118	93.81	15.90	68-129	99.63	19.59	61-119	95.41	15.99
Female	19	67-119	91.84	15.94	74-114	91-36	15.94	69-113	90.94	14.45
Total Appalachia	31	61-119	92.36	14.65	68-129	94.22	17.51	61-119	92.35	14.96

Table 7

Gumpgookies

Follow-up (Spring 1969)

Appalachia (N=39)

Follow-up Site Centers	Number of Pupils	Range Right	Mean Right	Range Wrong	Mean Wrong
Barbourville (Kentucky)					
Male	7	36-51	45.57	4-19	9.43
Female	14	30-53	47.21	2-25	7.78
Total Barbourville	21	30-53	46.66	2-25	8.33
New Canton (Tennessee)					
Male	3	34-53	45.33	2-21	9.66
Female	5	34-53	44.60	2-21	10.40
Total New Canton	8	34-53	44.74	2-21	11.37
Simpson (W. Va.)					
Male	3	33-51	43.33	4-22	11.66
Female	7	39-55	48.42	0-16	6.57
Total Simpson	10	33-55	46.89	0-22	8.09
Total					
Male	13	33-53	44.99	2-22	10.25
Female	26	30-55	46.74	0-25	8.25
Total Appalachia	39	30-55	46.32	0-25	9.26

Table 8

WPPSI Follow-up (Spring 1969)

Appalachia (N=5)

Intelligence Scores

Follow-up Site Centers	M	F	Verbal	Performance	Total IQ
Barbourville (Kentucky)		x	116	118	119
		x	90	93	91
		x	77	112	93
	x		89	89	88
	x		84	92	86
Range of Scores			77-116	89-118	86-119
Mean			91.20	100.80	95.40
SD			14.79	13.22	13.46

A Comparison of Disadvantaged Negro Children on the Stanford Binet Administered in Standard English and in the Negro Dialect Under Two Conditions of Reinforcement

Lorene C. Quay
Temple University

The inferior intelligence test performance of Negroes compared with whites, even when socioeconomic status is comparable, has been documented extensively (Dreger and Miller, 1960; Deutsch, Maliver, Brown and Cherry, 1964; Garret, 1947; Kennedy, Van De Riet and White, 1963; Shuey, 1958; Jensen, 1968). Several factors appear to depress the IQ scores of Negroes. Two of these factors, motivation and language, have received some attention, but their effects are still unclear.

Klineberg (1944) referred to several investigators who noted that Negroes were not as highly motivated on intelligence tests as most white groups. Zigler and Butterfield (1968) pointed out that the Negro child's response "I don't know" may be an attempt to terminate the uncomfortable interaction with the examiner rather than an indication that he really does not know the answer. They obtained significantly higher IQ scores for disadvantaged preschool children with a test procedure directed at optimizing the child's motivation to perform well on the intelligence test than with a standard intelligence test procedure. The "optimizing" condition was designed to make the child feel more comfortable and secure in the testing situation. Klugman (1944) found a significant difference for Negro children, ages 7 - 14, between tests using money and those using praise as an incentive. No such difference was found with white children. Haggard (1954) found the use of movie passes as an incentive to significantly increase the scores of eleven-year old Negro children. Relevant to these results is the finding that in discrimination learning tangible reinforcers are more effective for lower class children whereas intangible reinforcers are more effective for middle class children, suggesting that lower class children are less motivated to be correct just for the sake of correctness (Terrell, Durkin, and Wiesley, 1959). However, Tiber and Kennedy (1964) found no significant Binet IQ differences among seven, eight and nine-year old Negro, nor lower and middle class white children, when tested under four different incentive conditions: praise, reproof, candy reward, and no incentive. They did not describe the specific procedure that they used to administer the conditions.

The influence of communication skills on IQ scores has been questioned but has not been systematically studied. Carson and Rabin (1960) found that verbal comprehension may be superior to verbal communication in Negro children, suggesting that "differences between Negroes and whites on conventional intelligence tests, and especially on vocabulary subtests, may be primarily due to failure in verbal communication rather than in comprehension (p. 51)." Deutsch (1965) has also described the inferior communication skills of Negro children.

The relationship of language to intelligence has been construed in several different ways. It is Bernstein's view (1961) that language shapes thought and cognitive style. He identified two forms of communication: the "restricted code," characteristic of the lower class and the "elaborated code," characteristic of the middle class. His view, that the absence of exposure to the "elaborated code" causes poorer intellectual performance in the lower class, suggests that the structural-grammatical development of speech is largely responsible for cognitive development. Influenced by Bernstein's approach, many preschool programs for disadvantaged children focus on language stimulation, assuming that advances in language will facilitate cognition.

On the other hand, an increasing number of linguists construe the language abilities of Negro children in a different way. Stewart (1967, 1968) has shown that the Negro dialect is a language system which is logical, coherent, and in its own way grammatical, even though it differs from standard English. Reiterating Stewart's finding, Baratz (1969, p.88) states "that they (Negro children) speak a well-ordered, highly structured, highly developed language system which in many aspects is different from standard English." Linguists do not consider Negro children to have a "restricted" language, but a "different" language. They consider many of the procedures used by psychologists to be naive in that they ignore the language of the Negro child and judge him against the language norms of the white child. For example, Baratz (1969) criticizes Bereiter and Engelmann's statement (1966) that the concept of conditionality is absent as measured by the use of "if" constructions. She points to Stewart's finding that conditionality is expressed in the Negro dialect by the use of a word order inversion rather than with "if". "Thus, conditionality is expressed in the statement _I ask Alvin did he want to go_ ... even though in standard English the same kind of conditionality would be expressed ... _I asked Alvin if he wanted to go_"(p.90). This linguistic approach has implications not only for the theoretical question of the relationship of language to intelligence but also for practical procedures for studying and teaching Negro children. As a matter of fact, recommendations are increasingly being made that the

Negro dialect be incorporated into educational programs. Stewart[1] is presently writing a series of primers in the Negro dialect and planning a research program for testing their effectiveness in teaching reading to Negro children.

It is possible that the IQ deficit in Negro children is influenced by the fact that the test is not administered in the language of the child and the examiner may not fully understand the verbal responses of the child. If difficulty with standard English does operate to depress IQ scores in Negro children, they would be expected to obtain higher scores when the test is administered in their own dialect than when it is administered in the standard manner.

On the other hand, recent research has raised questions concerning the Negro child's supposed greater facility in comprehending the Negro dialect than in comprehending standard English, at least under certain conditions.

Although the influence of the mode of communication on intelligence test scores has not been studied, the dialect may have little influence on the comprehension and/or recall of less meaningful material than that found in intelligence tests. Peisach (1965) found no Negro-white differences on the Cloze Technique when first and fifth grade children were required to replace words deleted in passages from teacher's speech samples. On children's speech samples, there were no Negro-white differences when a Negro child's speech sample was used. However, white subjects were superior to Negroes when a white child's speech passage was used. The fact that Negro-white differences did not occur in response to the teacher's passage might suggest that when standard English is precisely spoken, Negro children are not inferior in comprehending it.

Weener (1969), studied social dialect differences between six- and seven-year old Negro and white children in the recall of verbal messages. The children were required to recall messages recorded by both middle and lower class women from middle and lower class sources. All the Negro children were dialect speakers whose parents had been born in the South. The effect of speaker differences was significant for standard speaking children (whites) but not for dialect speaking children. Weener concluded that children from nonstandard dialect communities seem to develop facility in comprehending the standard language at an early age.

Eisenberg, et. al. (1968) studied the listening comprehension of monosyllabic words by Negro and white children from low and middle socioeconomic levels when the words were spoken by both educated and uneducated members of each racial group. They found that white children had higher listening comprehension scores than Negro children, regardless of the race or education level of the speaker. However, the comprehension scores of both Negro and white children were higher in response to educated, as opposed to uneducated, and to white, as opposed to Negro, speakers. This finding strengthens the notion that precisely spoken standard English may be better understood than the Negro dialect by Negro children. It is even possible that the dialect might actually interfere with verbal comprehension in academic or quasi-academic settings, where children do not expect to hear it. Negro children, being involved with the speech patterns of both speech communities (the school and the home) may learn to expect and understand one type of speech in one setting and a different mode of speech in the other. If this is true, scores on intelligence tests presented in the Negro dialect would not be expected to be higher than scores on tests presented in standard English. A comparison of intelligence test results obtained when the test is administered in the Negro dialect and in standard

English is a step toward determining the influence of speech and language on the intellectual performance of Negro children.

The purpose of this research was to evaluate the influence of two factors, motivation and communication, on the intellectual performance of Negro pre-school children. The effects of two types of reinforcement (candy and praise) and two methods of communication (standard English and the Negro dialect) on Stanford-Binet IQ scores and on responses to individual Binet items were investigated. Specification of factors which depress IQ scores in the standard testing situation is crucial to an understanding of Negro-white differences in intelligence test performance and to the accurate measurement of intelligence in Negro children. Ascertaining whether the two variables studied here influence the intellectual performance of Negro children would have implications for practice, both in test administration and other learning situations. If scores are not found to differ as a result of these two variables, other sources of difference, such as the content of the items, must be sought to explain the relatively lower IQ scores of Negro children.

Method

Subjects

Subjects were 100 children from the Philadelphia Headstart Program. They ranged in age from three years, eight months through five years, three months with a mean age of four years, seven months. They were randomly selected and assigned to one of four groups of 25 subjects each. An analysis of variance indicated no age differences among the groups. The Stanford Binet Test of Intelligence, Form L-M, was administered under a different condition to the subjects in each group. Each condition consisted of a combination of the method of communication (dialect or standard English) and the system of reinforcement (candy or praise). Therefore, the conditions of test administration were: (a) Standard English, intangible reinforcement (praise); (b) Standard English, tangible reinforcement (candy); (c) Negro dialect, intangible reinforcement (praise); (d) Negro dialect, tangible reinforcement (candy).

Procedures

Two Negro male examiners, trained in the administration of the Stanford-Binet, administered the tests to all subjects. An equal number of subjects in each group was tested by each of the examiners. W. A. Stewart, a linguist whose specialty is the Negro dialect, translated the Binet into the Negro Dialect and also approved both the standard English and the Negro dialect of the two examiners. Sound recordings were made of all tests. Scoring was checked by a different person than the two examiners.

In the two tangible reward conditions, the examiners dispensed candy from a candy vending machine which had been converted to automatically dispense a candy when a crank was turned. The candies were Sweet and Tarts, colored sugar balls which readily melt in the mouth. When the subject passed the first item, the examiner dispensed a piece of candy, placed it into a paper cup in front of the subject, and told him that he could either eat it or keep it until later. Thereafter, the examiner placed one piece of candy into the paper cup each time an item was passed. The necessity of passing all items at the basal age, assured that subjects obtained rewards almost immediately after the testing began. If the subject failed an item, he was not given candy. The reinforcement was not given after each correct response, but only after the required number of correct responses to pass an item. For example, at the four-year level the child is required to make two correct responses to pass the Comprehension item.

If he made only one correct response, he was not given candy. In the event that he questioned the examiner about not receiving the candy, the examiner replied, "I cannot give the candy every time. You will probably get some more later."

Subjects in the intangible reward conditions were given verbal praise in the manner specified in the test manual. When the child passed an item, the examiner made a statement such as "that's good". Both examiners were warm, outgoing individuals who expressed praise genuinely.

A 2 x 2 analysis of variance was carried out to evaluate the treatment effects. Comparisons of item difficulty for the four conditions were made by determining the proportion of subjects in each condition passing each item.

Results

Table 1 presents the means and standard deviations of the four groups. An analysis of variance indicated no reliable differences among the groups and no significant interaction ($F < 1$ for all conditions). No sex differences occured in any of the conditions ($F=1.36$, $df=7/92$). Between the two Negro examiners, no differences were found for any of the conditions ($F=.58$, $df=7/92$), indicating a lack of examiner bias.

- - - - - - - - - - - - - -

See Table 1

- - - - - - - - - - - - - -

Item difficulty indicated by the proportion of subjects passing an item, is shown in Table 2. To find the proportion of subjects passing an item in each group only the responses of those subjects who had an opportunity to respond to the item were counted. For example, if a subject had a basal age of IV (passing all the items at the IV year level) and a ceiling of V (failing all the items at the V year level), he would have been given the opportunity to respond to items at the IV, IV-6, and V year levels, but not

Table 1

Means and Standard Deviations of IQ Scores

	Language			
	Standard English		Negro Dialect	
	Mean	Standard Deviation	Mean	Standard Deviation
Reinforcement				
Praise	95.84	11.64	97.12	10.84
Candy	96.16	11.03	95.44	8.77

to levels below IV nor above V. Therefore, he would be included in the analysis of item difficulty only at the levels to which he was given the opportunity to respond. The number of subjects is not the same for all groups nor for all age levels. Although the levels administered to all subjects ranged from III to IX (at IX, n=1), to assure a large enough sample for meaningful comparisons to be made, only those levels to which at least 50 percent of the subjects responded were evaluated. Using this criterion, item comparisons were made for levels IV through VI. Figures 1, 2, 3, and 4 present the patterns of performance at these levels. Although the VI year level met the criterion for inclusion in the analysis because 80 subjects were given the opportunity to respond to it, most of these subjects (n=56) reached the ceiling (failed all items) at this level. The small number of subjects in each group who passed any items (n=6,6,5, and 7 in the respective groups) makes group comparisons at the VI year level impossible. Figure 4 is presented merely to show which items were more and less difficult for the few subjects who did pass items at that level.

- - - - - - - - - - - - - -

See Table 2

- - - - - - - - - - - - - -

Figures 1, 2, and 3 show that the pattern of performance was identical for all groups at each age level. It is apparent that the differences among the groups in their performance on individual items is negligible, with two exceptions at the IV-6 level. Thus, the planned analysis of variance of item difficulty between groups was unnecessary.

- -

See Figures 1, 2, 3, 4

- -

The most reasonable explanation for the two discrepancies at the IV-6 level is that they are a chance occurrence, since out of 24 items, some

Table 2

Difficulty Level of Items

	N	Item					
Year IV		1	2	3	4	5	6
Group 1	22	.82	.95	.73	.86	.91	.64
Group 2	15	.73	.87	.80	.73	.93	.53
Group 3	20	.70	.75	.65	.85	.95	.70
Group 4	15	.67	.73	.53	.73	.80	.53
Year IV-6							
Group 1	24	.75	.33	.71	.21	.54	.71
Group 2	25	.76	.72	.72	.44	.60	.84
Group 3	23	.57	.43	.65	.43	.61	.70
Group 4	23	.78	.61	.78	.43	.61	.74
Year V							
Group 1	24	.25	.33	.67	.29	.50	.25
Group 2	25	.16	.50	.72	.44	.64	.20
Group 3	21	.29	.43	.67	.43	.62	.29
Group 4	23	.43	.43	.65	.30	.61	.26
Year VI							
Group 1	20	.05	.05	.05	.15	.05	.10
Group 2	23	.00	.00	.13	.09	.13	.09
Group 3	18	.06	.11	.06	.11	.11	.11
Group 4	19	.11	.16	.26	.00	.11	.16

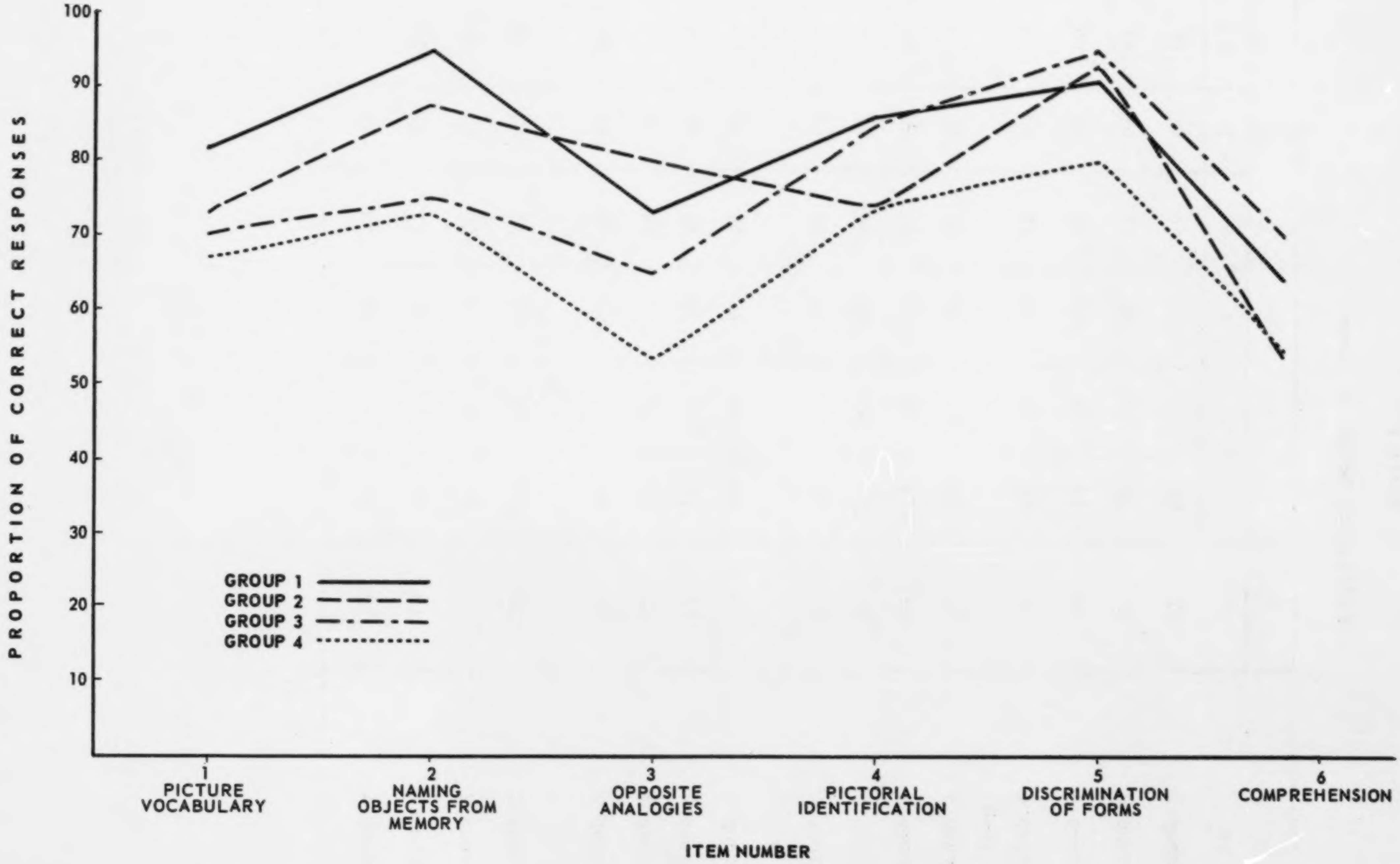


FIGURE 1 ITEM DIFFICULTY AT YEAR IV

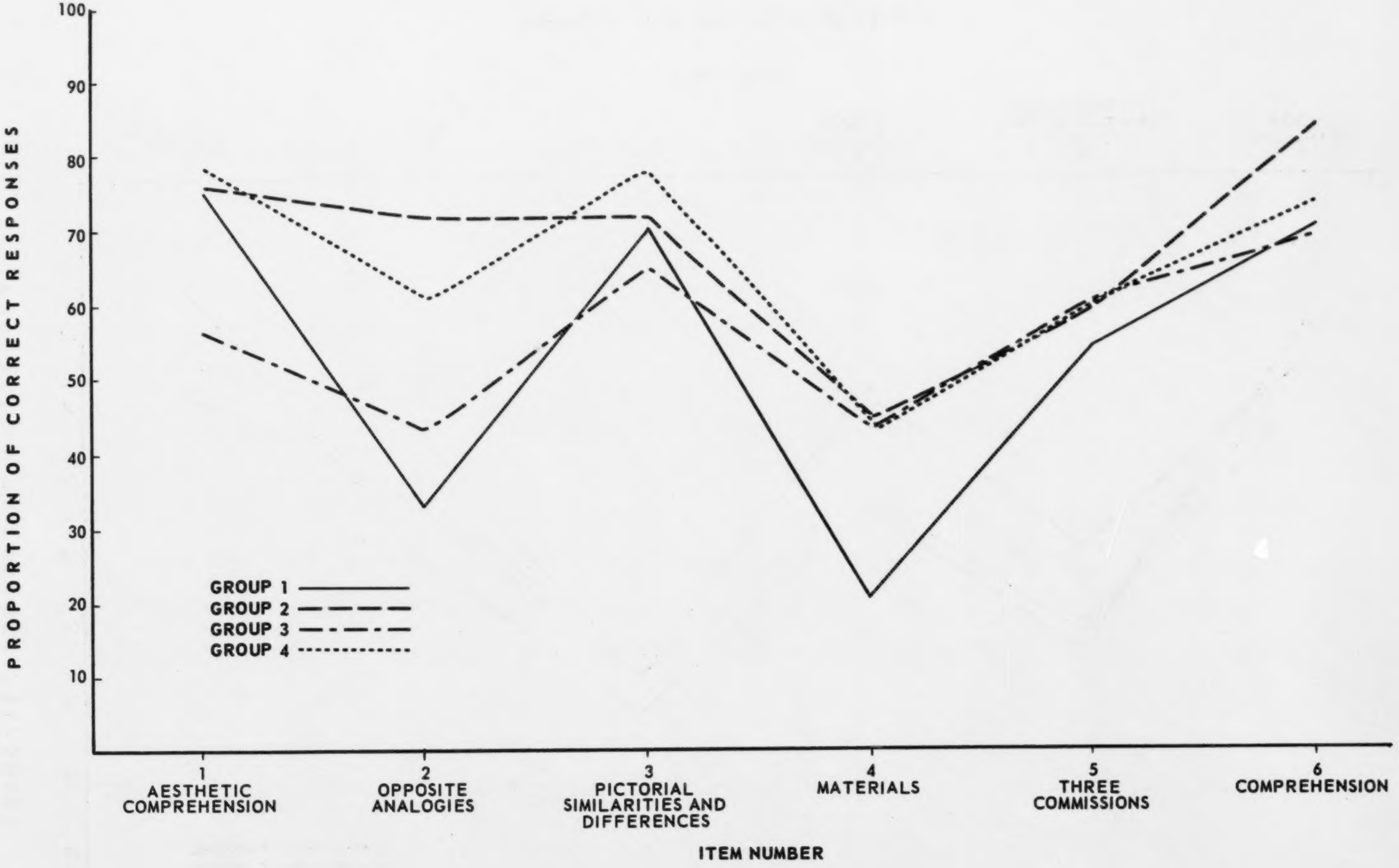


FIGURE 2 ITEM DIFFICULTY AT YEAR IV-6

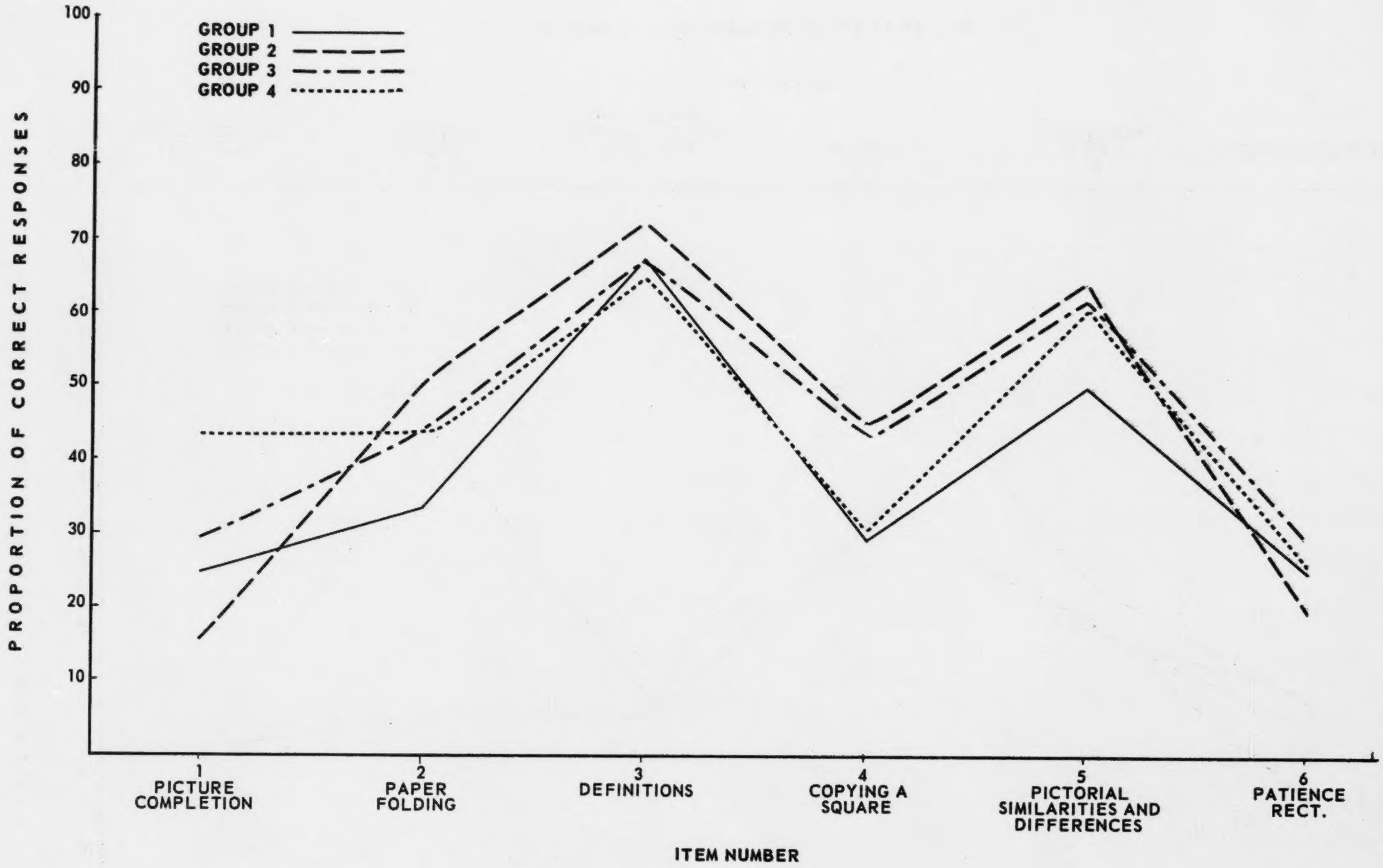


FIGURE 3 ITEM DIFFICULTY AT YEAR V

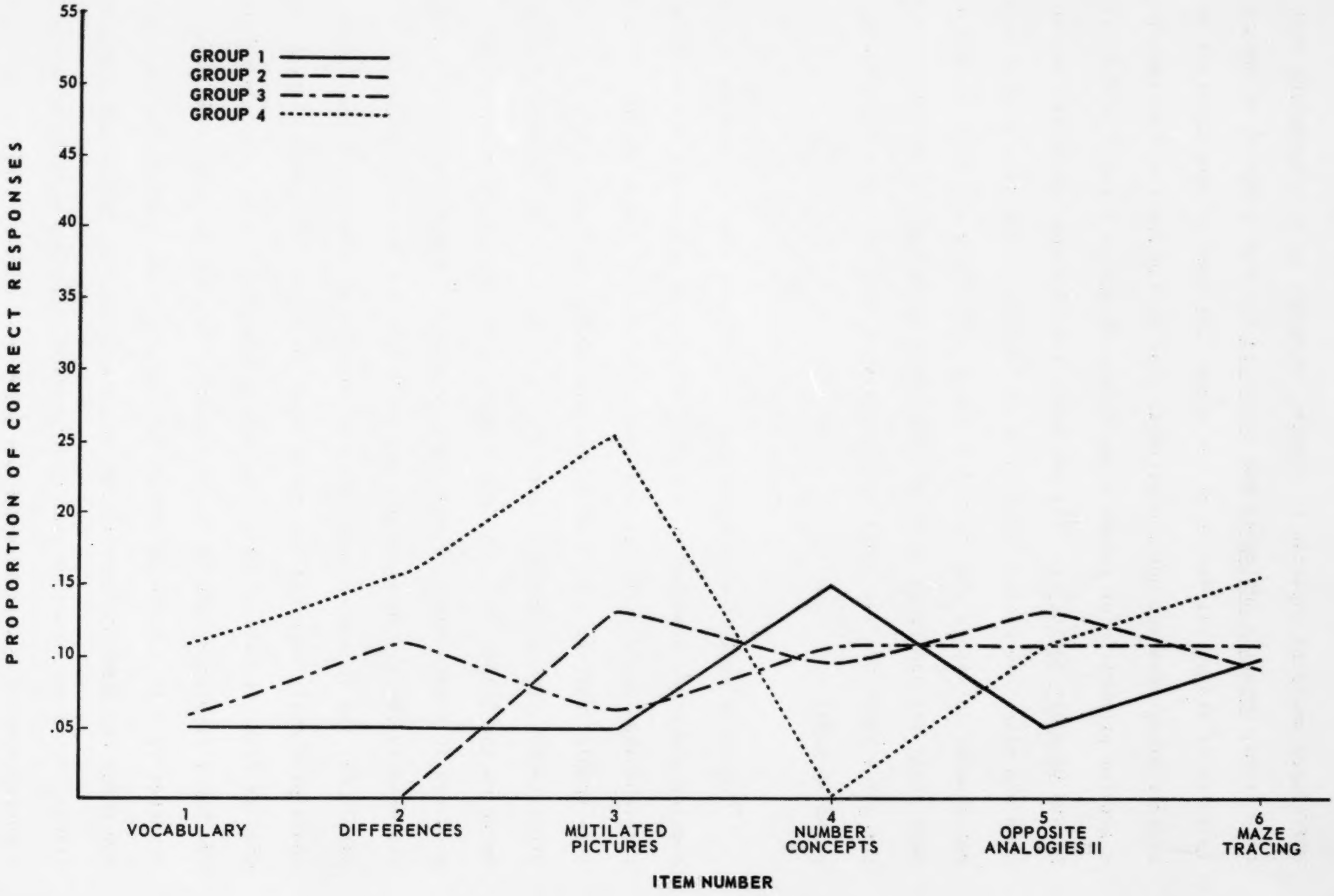


FIGURE 4 ITEM DIFFICULTY AT YEAR VI

difference would be expected by chance. However, it is interesting that both items, Opposite Analogies and Materials, are highly verbal in nature. In spite of the verbal nature of the items, the type of language used in administering them was not the variable that influenced the discrepancy. A greater proportion of groups 2 and 4 than of groups 1 and 3 ($Z=2.9$, $p < .01$) passed Opposite Analogies. The two candy reward groups performed better than the other two groups, regardless of language. Nor did language have any greater influence than reward on Materials, where groups 2, 3, and 4 were equal and had fewer failures than group 1, though the difference did not quite reach the .05 level of significance ($Z=1.93$, critical value for $p=.05$ is 1.96).

Discussion

The major goal of this study was to determine whether changes in the testing procedure designed to increase motivation and facilitate language comprehension would influence the IQ scores of young Negro children. For this sample, neither the candy reward procedure, the Negro dialect presentation, nor a combination of the two procedures facilitated performance on the Binet. The standard procedure for administering the Binet produced IQ scores equal to those obtained by the other procedures. Since the mean IQ for the total sample was 96.14 and the standard deviation was 10.48, the IQ scores were close to normal and certainly higher than those previously reported for young Negro children. The mean of this sample differs from the mean of 86.8 reported by Kennedy, Van de Riet, and White (1963) for Negro five-year-olds in the Southeast. It also differs from those reported by Gray and Klauss (1965) for their pretest experimental groups, for which the mean IQs were 86 and 91, respectively. Zigler and Butterfield (1968), using the standard testing procedure, reported much lower means for a socioeconomically comparable group prior to a nursery program (IQ=79) and for a control group (IQ=84). However, the mean IQ of the present sample had greater similarity to the post-test means of 95 and 96 obtained by Gray and Klauss (1965) after their subjects had attended a nursery school program, to the scores obtained by Zigler and Butterfield (1968) when their "optimizing" testing procedure was used (IQ 92), and to their post-test scores at the end of a nursery school program (IQ 92). It is possible that children in the present study are functioning so close to their intellectual limit that changes in testing procedure can do little to boost their already effective performance.

The present study provides no evidence concerning the causes of the higher scores of these children compared with similar groups. However, all the children were attending an all-day Headstart program in which they were provided a hot nutritious meal daily. Nutrition might even be a factor in their higher performance. It is unlikely that their performance can be attributed to specific programatic procedures. While some commonality certainly existed in the programs of the Headstart centers, a great deal of diversity is almost assured by the vastness of the program and the number of centers required to accommodate 5000 preschool children. Rather, the broad experiences of preschool attendance may have facilitated their ability to handle the testing situation effectively.

Zigler and Butterfield (1968) believe that the socioeconomically deprived child has more intelligence than he is able to utilize in a standard testing situation because of the "debilitating effects of motivational factors," including a general wariness of adults. They attribute reported increases in IQ scores resulting from programs varying in their cognitive-training procedures to changes in motivation rather than changes in cognition. The subjects in the present study were in a preschool program in which they had an opportunity to develop positive relationships with a large number of adults (teachers, teacher aids, nurses, social workers, and supervisors) and to become familiar with previously unfamiliar materials. That they generalized their positive feelings to the testing situation is indicated by the fact that not one subject was unwilling nor unable to cooperate with and respond to the examiners. It is apparent from the sound recordings that rapport was quickly established and the subjects interacted easily with the examiners. Although this study presents no objective evidence for this view, a logical assumption is that positive motivation did contribute to the higher scores. If this is true, motivation to perform well may have been so high that an additional motivational effect (candy) could not further increase performance. These children, having had opportunities to learn the value of intangible rewards, may have developed the kind of motivation previously characteristic of white, middle class children.

Candy rewards might be more effective for children from this population who do not attend preschool programs and thus have had no experience in situations similar to the testing situation. That is, if the negative effects of motivation do decrease performance in the testing situation, a candy reward condition might provide an incompatible incentive strong enough to counteract those effects, resulting in increased performance.

It is also possible that older children, many of whom have experienced negative school situations, may generalize to the testing situation so that their motivation would be different than the motivation of these preschool children whose school experiences have been positive. Thus, tangible rewards may provide a significant incentive for increasing their performance. Motivation might be one factor contributing to the decrease of IQ with age in Negro children (Kennedy, Van de Riet & White, 1963). As a matter of fact, the subjects of both Haggard (1954) and Klugman (1944), who found that tangible rewards produce increases in IQ, were considerably older than those in the present study.

One explanation for the lack of IQ differences between the language conditions may be that at the lower age levels of the test, all the language is so simple that the Negro child comprehends standard English sufficiently to deal with it at the level required. He must master standard English to at least a minimal level of proficiency in order to function in the preschool. If he understands all that is required to pass at these levels, changing the language to increase his proficiency in comprehending it will not increase his performance.

The nature of intelligence tests at lower age levels may also lessen the influence of language on performance. Most of the items at these age levels require the child to use very little language. The examiner's language is also simple and clearcut, lacking the subtleties found at higher levels. At the V year level, administered to 93 per cent of the present sample, only one item, "definitions," requires the subject to make a verbal response. Actually, the V year level has a greater preponderance of performance items (2 drawing items, paper folding, and patience rectangles) than other levels. Since this level was between the basal and the ceiling for most of the subjects, the effects of any condition which might influence performance should be revealed here. Since the language requirements are minimal at this level, it is not surprising that changing the language in an attempt to make it more familiar to the child has no influence on performance. On the other hand, it is interesting that a higher proportion of children passed Definitions, the one item at this level requiring a verbal response, than any other item. The other item which received a high proportion of passes, Pictorial Similarities and Differences, requires a minimal verbal response from the child, but the language used by the examiner is more complex than for the four performance items at that level. The fact that the total sample performed better on these two items than on the other items would not be expected if language difficulty actually did have an influence on performance at this level. All groups performed well on Comprehension, the other verbal item at this age level.

The analysis of item difficulty raises questions about the existence of a "language deficit" at least when applied to the verbal items on the Binet. At this age level, it seems unlikely that either a "restricted code" or a "different" language (i.e. Negro dialect) is responsible for the IQ deficit in Negro children. Although one or both of these factors might be important at higher age levels, or in other situations, the results of this study suggest that other variables must be sought to explain IQ deficits, when they exist, in four-year-old Negro children.

References

Baratz, Joan C. Language and cognitive assessment of Negro children: Assumptions and research needs. Asha, 1969, 11, 87-91.

Bereiter, C. and Engelmann, S. Teaching Disadvantaged Children in Preschool. Englewood Cliffs, New Jersey: Prentice-Hall, 1966.

Bernstein, B. Social class and linguistic development: A theory of social learning. In A. H. Halsey, J. Floud, & C. A. Anderson, (Eds.), Education, Economy, and Society. New York: The Free Press, 1961, 288-314.

Carson, A. S. & Rabin, A. I. Verbal comprehension and communication in Negro and white children. Journal of Educational Psychology, 1960, 51, 47-51.

Deutsch, M. The role of social class in language development and cognition. American Journal of Orthopsychiatry, 1965, 35, 78-88.

Deutsch, M., Maliver, Alma, Brown, B., & Cherry, Estelle. Communication of information in the elementary school classroom. Cooperative Research Project No. 908. Office of Education, United States Department of Health, Education and Welfare, 1964.

Dreger, R. M. & Miller, K. S. Comparative psychological studies of Negroes and whites in the United States. Psychological Bulletin, 1960, 57, 361-402.

Eisenberg, L., Berlin, C., Dill, Anne, and Sheldon, F. Class and race effects on the intelligibility of monosyllables. Child Development, 1968, 39, 1077-1089.

Garrett, H. E. Negro-white differences in mental ability in the United States. Scientific Monthly, 1947, 65, 329-333.

Gray, Susan W. and Klaus, R. A. An experimental preschool program for culturally deprived children. Child Development, 1965, 36, 887-898.

Haggard, E. A. Social-status and intelligence: An experimental study of certain cultural determinants of measured intelligence. Genetic Psychology Monographs, 1954, 49, 141-186.

Jensen, A. R. How much can we boost IQ and scholastic achievement. Harvard Educational Review, 1969, 39, 1-123.

Kennedy, W. A., Van De Riet, V., & White, J. C., Jr. A normative sample of intelligence and achievement of Negro elementary school children in the Southeastern United States. Monographs of the Society for Research in Child Development, 1963, 28, No. 6.

Klineberg, O. (Ed.) Characteristics of the American Negro. Harper, 1944.

Klugman, S. F. The effects of money incentives versus praise upon the reliability and obtained scores of the Revised Stanford-Binet Test. Journal of Genetic Psychology, 1944, 30, 255-269.

Peisach, Estelle C. Children's comprehension of teacher and peer speech. Child Development, 1965, 36(2), 467-480.

Shuey, Audrey M. The Testing of Negro Intelligence. Lynchburg, Va.: Randolph-Macon Women's College, 1958.

Stewart, W. A. Sociolinguistic factors in the history of American Negro dialects. The Florida FL Reporter, 1967, 5, 1-4.

Stewart, W. A. Continuity and change in American Negro dialects. The Florida FL Reporter, 1968, 6.

Terrell, G., Jr., Durkin, K., & Wiesley, M. Social class and the nature of the incentive in discrimination learning. Journal of Abnormal and Social Psychology, 1959, 59, 270-272.

Tiber, N. & Kennedy, W. A. The effects of incentives on the intelligence test performance of different social groups. Journal of Consulting Psychology, 1964, 28, 187.

Weener, P. D. Social dialect differences and the recall of verbal messages. Journal of Educational Psychology, 1969, 60, 194-199.

Zigler, E., & Butterfield, E. C. Motivational aspects of changes in IQ test performance of culturally deprived nursery school children. Child Development, 1968, 39, 1-14.

Footnotes

1. Stewart, W. A., Personal communication, 1969.

Emotional Characteristics of Disadvantaged Children of Appalachia

Theron Alexander[1]

A. Introduction

It is possible that one of the effects of an inadequate environment is deviant emotional development. Such development may result from stress and disorder in the family or from thwarting of need fulfillment by environmental circumstances. It is important to know about the nature or the effect of an adverse environment on emotional development not only because emotional disorder may be one result, but because motivational patterns of behavior may be affected to the extent that other areas of development, for example, cognitive development, may be impaired.

In earlier research an effort was made to study the effects of an adverse environment on emotional perceptions of children living in a limited area (Alexander and Anderson, 1957). The subjects in the study were Northern Cheyenne Indian children living on a reservation. Certain theoretical principles were used which have some relevance for this present study. For example, emotional perception was viewed as depending on a selective process growing out of intraorganismic needs and environmental conditioning. The interaction of the individual

---

[1] The assistance of Dr. Judith Stoyle, John Tighe, and Margaret Havard is gratefully acknowledged.

with the environment then was seen as significant in determining essentials of the response patterns. Thus, an adverse environment would be reflected in the individual's general behavioral style. Further, perception was seen as involving the assignment of meaning to stimuli with conditioning and environmental interaction being causative in the selection of meaning assigned to stimuli.

In this study of the Indian children the cultural and environmental conditions were found to be adverse indeed. The reservation was on range and forest land given to the tribe in the last century. The economic state of the people was quite low and there was evidence of feelings of insecurity and anxiety, some of which came from the fear of hunger. Housing conditions were primitive and unsatisfactory, nutritional problems were common and disease was much more prevalent than in American culture at large. Those few Cheyenne adults who sought to work off the reservation could only perform unskilled tasks. A frequent phrase in Cheyenne was: "We are distressed." Analysis of the responses of the children showed that there was a limited verbal response to the stimuli presented--cards containing pictures of Cheyenne in social interaction. The perceptions of human beings were described as more often hostile than beneficent. Physical environmental characteristics were seen as particularly threatening--the children spoke of fear of death, being lost, and the dangerous forces of nature.

In consideration of the results of this research, a hypothesis was made that children living in the deprived environment of the

Appalachian mountains also would be limited in their ability to respond to stimuli in their environment. Since this earlier study of the Indian children, research has led to the development of more objective means of analysis of the data than was first possible.

In a recent study of emotionally disordered children an effort was made to develop means of differentiation between emotional normality and disorder through the use of a lexicon of emotional words (Alexander and Leaverton, 1967). Also, objectivity was increased by placing all of the children's responses on data processing cards and then using a computer program for analysis of the data. First, the five cards were shown to all of the subjects individually. The children were told to respond to the figures in each card and to describe the interaction and the emotions of the figures. The responses were recorded and then placed on data cards. A lexicon of five "positive" words and five "negative" words was used (See Table 1). A formula taking into account the extent of the total verbal response as well as the use of positive and negative words was used. It was found that the children with behavior disorder had a more limited verbal response and used more negative emotional words than did normal children. Also, recently, in studies by other investigators similar techniques have been used (Farmer, 1967; Fenster, 1967).

In the present study principles of the earlier research were applied. The primary question to be answered here was: do the emotional characteristics of Appalachian disadvantaged children differ from middle class or advantaged children?

TABLE 1

Lexicon: Positive and Negative Emotional Words Used to Investigate Responses of Subjects to Study Stimuli

Positive	Negative
friend(s)	fight
good	mad
happy	sad
playing	scold
well	sorry

B. Method

1. Subjects

The subjects in this study were 93 white, six-year old children. Of this number, 34 (15 boys, 19 girls) were "disadvantaged." The remainder, 59 (28 boys and 31 girls) were middle class children living in a town with a population of about 40,000. This latter group is referred to as "advantaged" because the circumstances under which they live seemed to typify the majority of people in American society. There were none living in poverty and all were rated as "middle class" by Warner's Index.

The "disadvantaged" children of Appalachia are from the mountains and "hollows" where their families have lived for generations. The subjects lived with both parents and siblings in relatively socially isolated areas. Ways of making a livelihood in the mountains primarily consists of using simple agricultural methods on poor soil. Monetary income is extremely low.

2. Procedure

The subjects in both groups were shown five cards containing human figures. The figures were depicted so that ambiguity in relation to activity and emotion was achieved. Drawings of the stimuli used are shown in Fig. 1.

The verbal responses of each subject were written down as the child talked. Each child was seen individually.

The responses were placed on data processing cards as a method

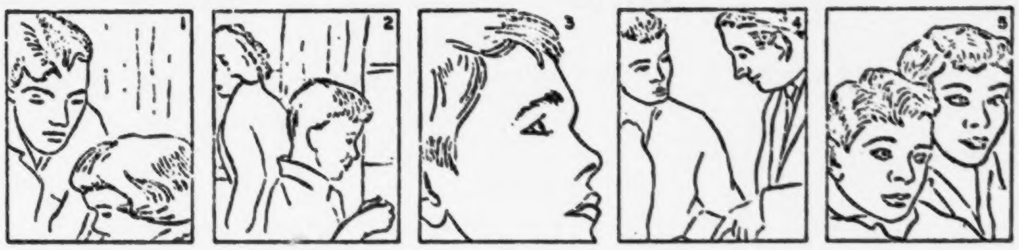


Figure 1. Drawings of the Five Stimulus Cards Used in the Present Study The Original Cards are Black and White Photographs.

of analysis based on the earlier research was used (Alexander and Leaverton, 1967). An analysis with a computer program using a formula (T + 50d) was undertaken. In the formula, "T" stands for the total number of words used by a subject in response to the five stimulus cards; "d" represents the algebraic difference between the number of positive and negative words used by the subject (see Table 2); and, "50" was used as a weighting factor--this factor was determined by finding the smallest number of classification errors in reference to any other weighting factor.

C. Results

A statistically significant difference was found between the disadvantaged subjects and the advantaged subjects on the basis of the formula T + 50d. The mean for the normal group was 168.6 and for the disadvantaged 96.7 ($p < .05$, median test). No significant difference in response was found between the sexes. See Table 2 and Figure 2. In Figure 3 the use of emotional words by the groups is shown. The percentage of the disadvantaged children using positive words was relatively similar to the percentage of the advantaged children using positive words. However, the percentage of the disadvantaged children using negative words was over twice as great as the percentage of advantaged children.

D. Discussion

The findings of this study suggest differences in emotional perceptions and development between disadvantaged and advantaged children. While such differences might be expected, it seems to be

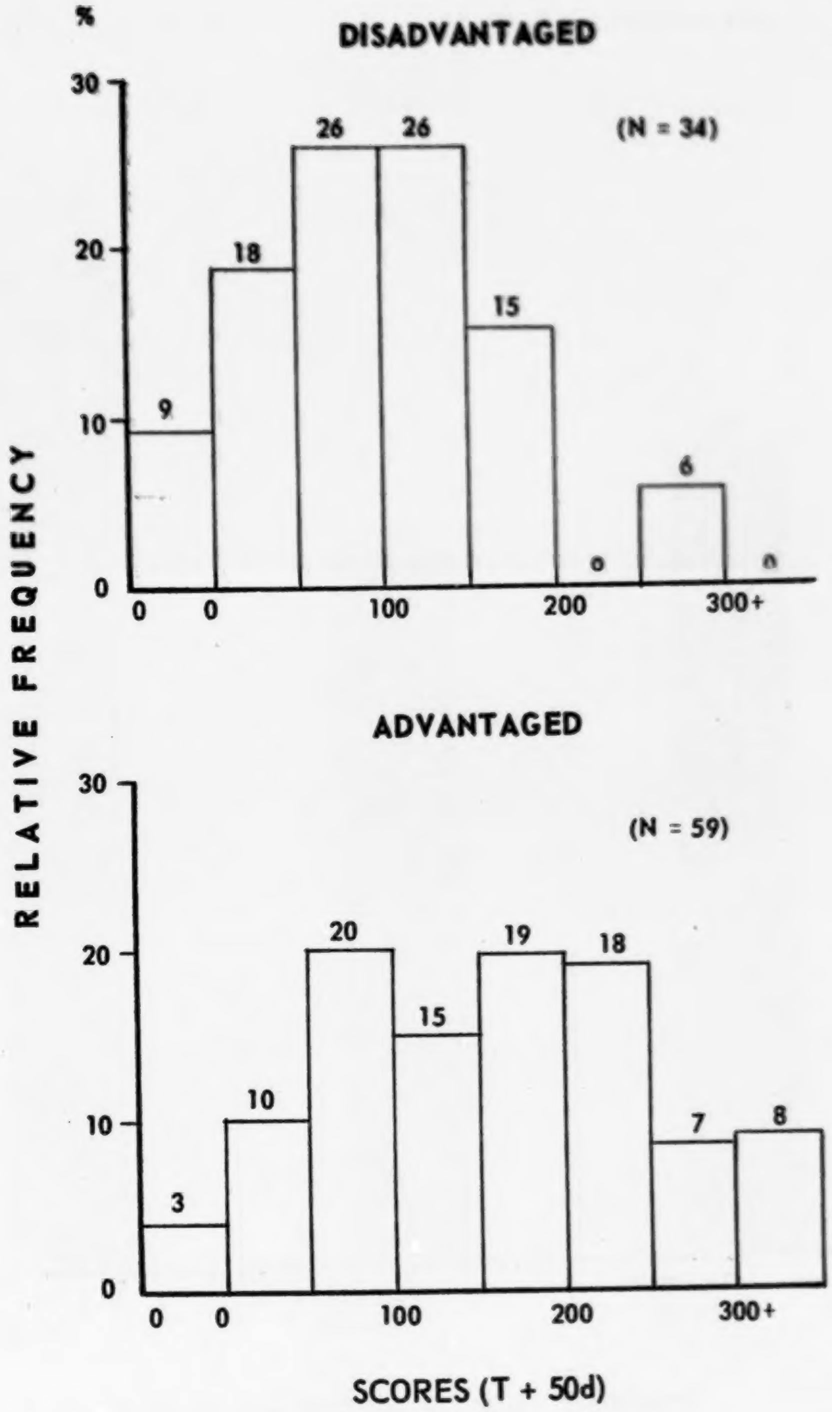
TABLE 2

Subjects' Use of Emotional Words

Group	Percent of Subjects		
	Using Positive Words	Using Negative Words	Using Emotional Words
Disadvantaged (N=34)	53	47	71
Advantaged (N=59)	46	22	56

FIGURE 2

RELATIVE FREQUENCIES FOR GROUPS OF SUBJECTS BASED ON SCORES DERIVED FROM FORMULA T + 50d



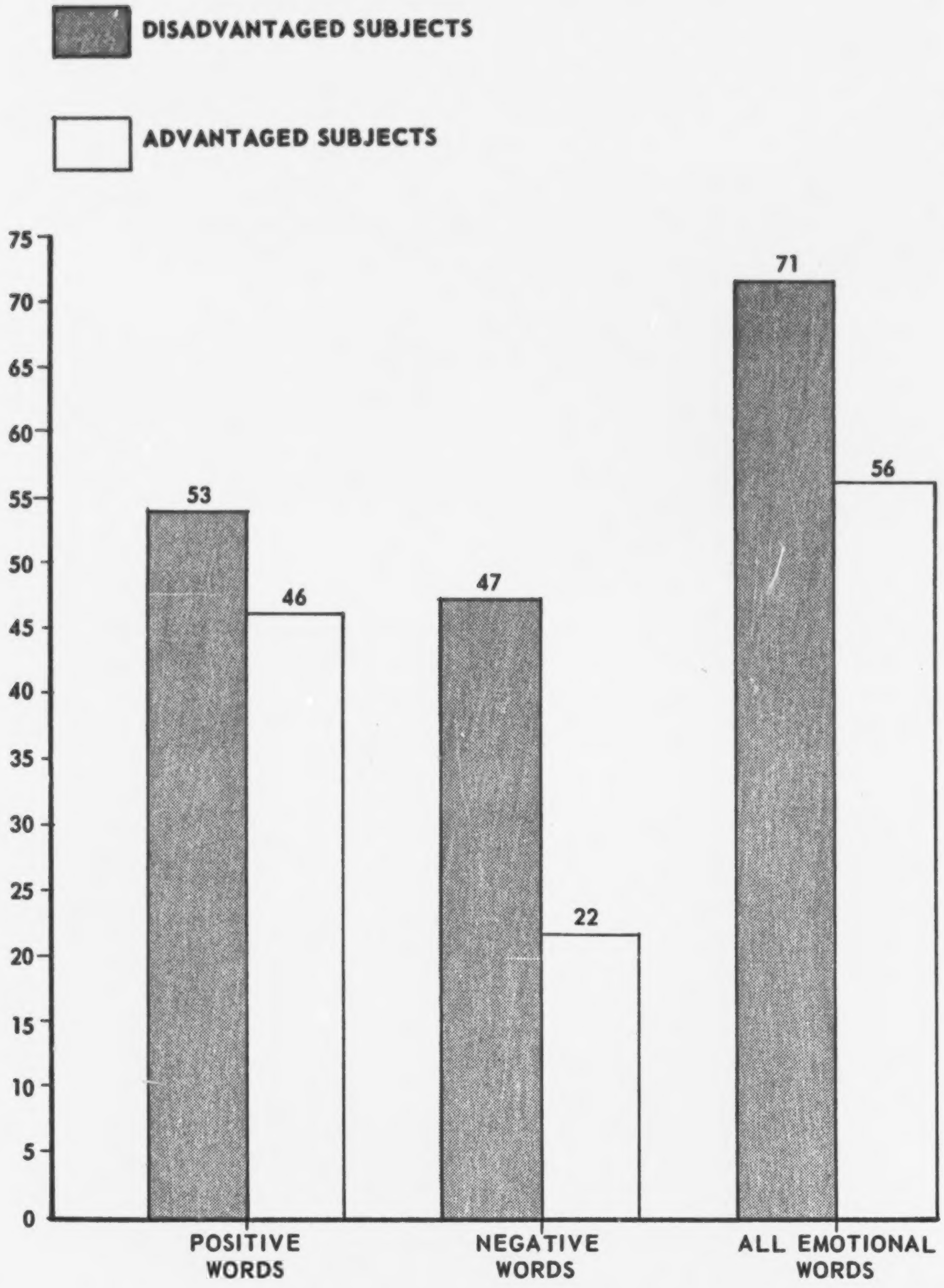


FIGURE 3 USE OF EMOTIONAL WORDS

important for ameliorative programs, particularly those of an educational nature, to take into account such differences. If a tendency to perceive non-threatening or neutral stimuli as hostile persists into adulthood, problems for the individual in a social order may be increased. And, the social order may indeed be adversely affected as a result of the influence of such individuals.

References

Alexander, T., and Anderson, R. Children in a society under stress. Behavioral Science, 1957, 2, 46-55.

Alexander, T., and Leaverton, P. Differentiation between normal and disordered children by a computer analysis of emotional and verbal behavior. Journal of Psychology, 1967, 67, 141-146.

Farmer, C. Words and feelings: A developmental study of the language of emotion in children. Dissertation Abstracts, 1967, 28 (5-B), 2134-2135.

Fenster, C. A. Vocal communication of emotional meaning among adults and children. Dissertation Abstracts, 1967, 28 (4-B), 1694-1695.

Project III

Study I	The Concept Readiness and Several Applications to Disadvantaged Children
Study II	Use of Multiple Criteria to Evaluate Effects of Early Educational Intervention on Subsequent School Performance
Study III	The Effects of Nurturance Deprivation in Lower Class Black Children: Part II
Study IV A	A Developmental Study of the Effects of Different Types of Reinforcement on Problem-Solving in Children
Study IV B	The Relative Effectiveness of Candy as a Reinforcer on Problem-Solving in Lower-Class, Preschool Children
Study V	The Teacher-Child Interaction and the Impact of Head Start Programs on Cognitive Development in Disadvantaged Preschool Children: Part II
Study VI	An Experimental Study of Teaching Styles and Creativity in Children
Study VII	Continuities of Home and School Environments and Their Effect on Problem-Solving in Elementary School Children
Study VIII	Moral and Cognitive Development in Lower Class Children: Part II - Perception

E. Kuno Beller

Professor of Psychology

ABSTRACT

To simplify this presentation, the present report will be a continuation of last year's Annual Report. The introductory overview of last year's report still applies to our continued work. Our studies which have been carried out in our Developmental Research Laboratory as part of Head Start Research have investigated interacting effects of environment factors and personality factors on developmental changes in the behavior of children between four and nine years of age.

The environmental factors that we have investigated can be classified as controlled naturalistic factors and as experimental manipulated variables. Among the naturalistic environmental factors, we have been investigating the child's family background and the educational history of the child. With regard to the experimental modification of the environment, we have investigated interacting effects of nurturance deprivation. and conditions of reinforcement on a child's learning of cognitive tasks.

With regard to personality variables, we have investigated the role of motivational and emotional factors as well as perceptual and cognitive dispositions as mediators between environmental influence and developmental change in behavior.

Our dependent variables have consisted of (a) standardized verbal and non-verbal measures of cognitive functioning, e.g., Stanford-Binet Tests, the Peabody Picture Vocabulary Test, the Goodenough Draw-A-Man Test, the Science Research Associates Achievement Test, the Stanford Achievement Test, the Iowa Tests of Basic Skills, the Torrance Creativity Test, and

(b) a problem-solving task which we have constructed for our own purposes.

Some of the major new findings contained in the present Annual Report have been as follows:

Study II - Follow-up Study: Our continued follow-up study of the effects of the timing of educational intervention in disadvantaged children supports the earlier findings. Group 1, consisting of children who experienced educational intervention earliest, namely from nursery on, maintain their initial gain without change over five years from kindergarten into the fourth grade. Group 2, consisting of children who started school with kindergarten retained their position between Groups 1 and 3. Group 3, consisting of children who entered school at first grade without any preschool experience, also retained their earliest gain from first grade into the fourth grade, but, as previously, remain clearly below Groups 1 and 2 as in previous years. A similar but less pronounced trend appears on the Peabody Picture Vocabulary scores. The relative ranking of Groups 1, 2, and 3 is consistently in the same direction as on the Stanford-Binet, especially with respect to the lowest rank of Group 3. However, unlike the Stanford-Binet, the Peabody scores show a small but consistent gain from kindergarten into the fourth grade for two of our groups (Groups 1 and 3).

The Draw-A-Man scores show a strikingly different trend from the Stanford-Binet and Peabody Picture Vocabulary tests. After an initial rise from kindergarten to first grade, in all three groups a decline started which continues to persist into the third and fourth grades.

The introduction of new tests and a discussion of the overall analysis of five years of follow-up which is currently underway will be described later in the report.

Study III - Nurturance Deprivation (Replication): The study reported last year yielded the finding that the history of a child's nurturance deprivation has a significant effect on the child's sensitivity to renewed experiences of such deprivation. This study is being replicated with the addition of several control groups and several other variables. The trends in the replication study seem to bear out the findings of last year's study. Background nurturance deprivation also seems to related to a child's I.Q., to his impulsivity and to his field dependence.

Study IV A- Reinforcement Study: A comprehensive study investigating the relative effectiveness of two major dimensions of reinforcement, namely extrinsic versus intrinsic and social versus nonsocial, was carried out on a sample of 640 children in which ethnic background, social class and the sex of the child were controlled in each of five age levels, that is, from nursery through the third grade. Male and female, black and white experimenters were assigned systematically to all these conditions so as to control for experimenter effects. I.Q. measures and measures of field dependence were obtained in all children. The data have been collected for this study and are currently being processed for analysis. Two initial overall ANOVAs were carried out for purposes of the present report. They show that ethnic identity, social class, affect learning each by itself and in interaction with one another. Of our two reinforcement dimensions, extrinsic versus intrinsic reinforcement was signficant, whereas social - nonsocial was not.

We also found an experimenter effect, i.e., ethnic identity and sex of experimenter, interacted in their effect on the child's learning.

Study IV B - The Effectiveness of Candy as a Reinforcer: This study was carried out to investigate the relative effectiveness of candy as a reinforcer when it is compared with our two major dimensions of extrinsic-intrinsic and social-nonsocial reinforcement. The study was limited to a sample of lower-class black nursery children. Candy was less effective than any other condition of reinforcement.

Study V - The Impact of Head Start Programs: The substantive findings of this study were reported in the last Annual Report. Briefly, it was found that children who gained from Get Set in terms of increases in their intellectual performance differed from other children by making relatively more instrumental (realistic) and less emotional dependency requests of their teachers, eliciting more positive reactions from the teachers, coping more constructively and less regressively with frustration. We also found that the learning process had more self-rewarding characteristics in gainers than in other children. Since the last report, we have related our own findings to other data which were collected on the same children as part of the National Evaluation Study. We found that children from crowded homes had less intensive relationships with the teacher in the Get Set Program. Children who were high on impulsivity, excitability and defiance on the behavior inventory were less effective in getting the teacher's attention. These same children were also more distracted by their social environment. Finally, certain teacher characteristics measured by the Observers Rating Form in the

National Study related to a child's ability to learn under conditions of Task Intrinsic Reinforcement, that is, to make the learning process a more self-rewarding one.

Study VI - Teaching Styles and Creativity: On the basis of our scales for measuring teaching styles, autocratic and democratic teachers were selected from second and fourth grade classrooms in a middle-class elementary school in Wilmington, Delaware. The two teaching styles were experimentally reproduced, and children from each classroom were assigned randomly to each of the two experimental groups. The Torrance Test for Creativity was used as a dependent measure, administered before and after the experimental experience.

We found that both the child's age and the consistency with which he experiences different types of teaching affect the creative aspects of his performance. Consistency of experience seemed to encourage "originality". When the teaching experience was consistently democratic and open, the older child became more "flexible". In contrast, the younger child tended to become less "flexible" after being exposed consistently to an autocratic-closed environment. Thus, consistency and content of experience as well as the child's development all affected the relationships between the learning situation and crativity in a psychologically meaningful way.

Study VII - Continuity of Home and School: The continuity of the child's environment also affected the child's ability to solve problems. Second grade children who experienced consistently a democratic learning environment performed significantly better on a problem-solving task than children who experienced consistently authoritarian learning environment or came from an inconsistent experience background. This finding applied only to the second grade and not to the fourth grade children.

Measures of the home environment, based on the PARI, revealed similar effects of the home environment and classroom environment on a child's performance in a learning situation. Finally, complex interactions were found between home environment, classroom environment, and the effectiveness of different conditions of reinforcement on problem-solving.

Study VIII - Moral and Cognitive Development: In our last Annual Report, we described the outcome of a study investigating relationships between cognitive development and moral development in lower-class children from kindergarten through the sixth grade. The major finding reported from that study was that a child's concept of time, i.e., his ability to organize his experiences along a time dimension, was highly correlated with both maturity of moral judgment and moral conduct. In a continued analysis of the data collected in this study, we found that a child's perception of the passage of time is highly correlated with maturity of moral conduct, but not with maturity of moral judgment.

STUDY I

THE CONCEPT READINESS AND SEVERAL APPLICATIONS TO DISADVANTAGED CHILDREN *

E. KUNO BELLER
TEMPLE UNIVERSITY

The first part of this paper will deal with a review of the concept of readiness and a proposed formulation, the second part with the application of this formulation to recent research on cognitive processes and the teaching of cognitive operations. The third part of the paper will deal with implications of research on emotional and motivational factors for readiness in disadvantaged children.

THE CONCEPT READINESS

Few concepts in education have been surrounded with more controversy than the concept readiness. Nevertheless, the question of whether the child is ready to learn and to be taught anything new in the cognitive, social or emotional realm remains a vital issue to many educators. Rousseau's (15) viewpoint of two centuries ago, which is well reflected by his statement, "Regard all delays in teaching as so much time gained; it is already a great gain to have reached this stage without loss: let childhood ripen in children. On the other hand, are certain lessons unavoidable? If so, be careful not to administer them today, if they can safely be put off until tomorrow,"

---

* The discussion of applications is based in part on research carried out by the author with support from the Ford Foundation through a grant to the Philadelphia Council of Community Advancement and with the support from the Head Start Evaluation and Research Center at Temple University.

has continued to the present day. Underlying Rousseau's concept of readiness was a concept of maturation. One of his major criticisms of education in his day was that educators did not wait for the necessary faculties to ripen in the child. He advised educators to make maximum use of sensory-motor functions which are well developed in the child and suggested a series of activities which the child could carry out and which would go a long way in preparing him for more complex intellectual activities later on in his development. Rousseau's ideas were formalized into a pedagogic system by Pestalozzi (13) and Montessori (12). The elaboration of Rousseau's ideas of a sensory-motor phase of development as part of a theory of cognitive development had to wait for the genius of Piaget two centuries later. It is important to keep in mind that, whereas Rousseau and his followers emphasized the concept of readiness, they labored hard to specify the activities which the young child was ready to carry out in preparation for later stages of development. Some of these specifications will be discussed in the context of Piaget.

A different school of readiness which bears some superficial resemblance to that of the thinkers discussed above is represented by Gesell and his associates. Gesell continued the tradition of Darwin, Galton and Hall (11) and was more interested in biological speculations about developmental changes in behavior than in the interactions of organism environment and experience and the effects of this interaction on development. He considered maturation as the basic principle for development and maturation was conceived as developmental change due to inner forces. Environmental factors may influence these developmental sequences but the basic course is laid down by biological factors (7). So, we find Ilg and Ames (9) of the Gesell Institute, who developed an elaborate battery of tests for school readiness, write: "The need for accommodation of the environment to both age and individual differences becomes evident from the moment of the child's birth...as hard as the mother may try to impose a rigid schedule on some infants, she is not successful unless she responds to the individual demands....", and "...the greatest single contribution which can be made towards guaranteeing that each individual child will get the most possible out of his school experience is to make certain that he starts that school experience at what is for him the "right" time. This should be the time when he is truly ready..." (9). For Ilg and Ames, true readiness is based on careful records of what children actually do under normal circumstances. Environmental factors such as ethnic background, social class or any other system of environmental influences are not given any systematic place in the determination of readiness. Biological speculations are offered in the place of psychological theory to account for developmental change. We find the same viewpoint reflected by others who are much more concerned with education and curriculum than was Gesell and his associates, e.g. Hymes (8). "As surely as the baby say and crawled and sttod and walked, always in his own good time, the power on which reading instruction can build will also develop. Maturation and living make this inevitable."*

At the opposite extreme, we find statements such as those made by Watson earlier in the century: "Give me a dozen healthy infants, well-formed, and my our specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select - doctor, lawyer, artist, merchant-chief and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors," and more recently by Bruner (3); "The foundations of any subject may be taught to anybody at any age in some form." Such statements provide useful information concerning attitudes underlying educational policies in a broad sense, but they hardly qualify as propositions of knowledge, especially in the empirical sense.

---

* For an informative discussion of the ambiguity surrounding the concept of maturation the reader is referred to: Tyler, Fred T., "Issues Related to Readiness to Learn" (19). For an interesting discussion of the implications of the concept of readiness with regard to the age at which a child can be taught cognitive skills, the reader is referred to an extensive review by W. Fowler, "Cognitive Learning in Infancy and Childhood" (4).

The concept readiness is too complex to lend itself to simplistic generalizations. Statements concerning readiness become more meaningful, in the sense of being testable in some ways, when the criteria of readiness are pinned down to specific activities or operations in such a way that their relationship to the rate of learning and level of achievement of new activities or operations can be ascertained and in some way predicted. Even more important for the concept of readiness to be meaningful is the requirement that the activities and operations which define readiness relate in some logical way to new activities and operations which are to be learned or to the educational method by means of which the new operations are to be taught. This approach to the problem of readiness poses greater difficulties, especially for studies dealing with developmental change in complex psychological processes.

COGNITIVE FACTORS IN READINESS

Fruitful beginnings in this direction of the proposed formulation of readiness have recently appeared in the research literature. Gagne's (5,6) research on the role of learning sets in the acquisition of knowledge, particularly his study of readiness for learning various steps in the hierarchical sequence of mathematical operations, meets some of the require-

3.

ments which are being proposed in this paper for the study of readiness to learn complex cognitive operations. Gagne proposes a hierarchical system within which certain operations such as "counting," "addition," "subtraction," "multiplication," and "division" are the elementary steps which have to be mastered by an individual to be ready for an understanding and for the mastery of more complex steps such as the solving of equations.

Piaget's formulations of cognitive development have opened up new horizons for the establishment of successive criteria of readiness as a propensity to move from isolated, less coherent mental operations to increasingly more interrelated and complex cognitive operations. For example, in Piaget's (14) system of sensory-motor development, vision and prehension start out as isolated reflexes. The integration and eventually the dominance of vision over prehension not only moves a child to a higher level of development, but changes altogether the child's experience. Passive reflexivity changes into voluntary and eventually into goal-directed behavior. This and other formations described in great detail by Piaget, lay the foundation for further intellectual development such as intentional cognition. At this point, Piaget shows how the next step in cognitive development depends heavily upon experience. While engaging in goal-directed behavior and encountering obstacles in the path towards the goal, the child develops notions of temporal sequence, causality, and the relationship between objects other than himself. Confrontation and interaction with peers forces the child to question the validity of his egocentric views and to revise them. Piaget shows how each stage in development makes a child ready for the next step. Most importantly for the meaning of readiness, Piaget makes explicit the logic of developmental progression and shows how operations on one stage prepare the child for operations on the next stage. Piaget's concept of conservation is a case in point. He defines clearly the mental operations, e.g. decentration, multiple classification and reversibility, which a child must be able to carry out so as to be ready for the operation of conservation, which requires the synthesis of these operation. Sigel (17) has carried out a series of pioneer studies in this area. These investigators have trained children who could not conserve in the prerequisite operation of multiple classification, multiplicative relations, reversibility and seriation. They found that such training of prerequisite operations made the child more ready to carry out the operation of conservation. It becomes clear the Piaget's system of cognitive development provides a meaningful model of progression in which mastery of certain operations meets the criteria of readiness which appear most meaningful to this writer. Research such as that carried out by Sigel and his associates promise to provide experimental verification of such criteria of readiness in cognitive development.

The discussion so far has been limited to a consideration of readiness in relation to the development of cognitive abilities and skills. The concept of "cognitive styles" does not refer to an ability or skill but rather to a disposition which may influence a child's readiness to benefit more from one type of instruction than from another. In other words, cognitive style may function as a readiness factor in the individualization of instruction. To illustrate such a relationship, the writer will discuss a study which he has carried out recently (1). To begin with, a child may order the world he experiences or what he perceives in a variety of ways. One of the ways in which a child may accomplish this is by grouping or classification. There are different types of classification. Kagan et al. (10) and Sigel (18) have referred to this process as "cognitive style" and have distinguished several different styles. They have developed first a set of pictures (10) and later a set of object (18) to determine the preferred style of any individual. Sigel has distinguished three major styles: a descriptive-analytic or part-whole style; a contextual-relational style; and a categorical-inferential style. The term descriptive-analytic or part-whole cognitive style refers to the classification of objects in terms of their objective characteristics such as color, size or form. The contextual-relational style refers to the classification of objects in terms of their functional use and relation to each other. The term categorical style refers to the classification of objects in terms of some inferred characteristics which are not directly observable.

It is assumed that children form such preferred dispositions or styles of experience early in their life and that these remain stable characteristics, in other words, offer and experiential typology. In a recent study (1), the present writer has investigated the possibility that methods of language training may correspond to one or another of these cognitive styles and that this common core might make a method of training more or less effective, depending upon its correspondence with the child's preferred style. Such a study was indicated because of the nature of certain types of language instruction. For example, phonetic training, the training of vocabulary and classification consist largely of teaching a child to associate letters or sounds with words, words with objects, words with words, and objects with objects. The association between words and between objects is achieved through the use of criteria for grouping objects as belonging together or as not belonging together. Moreover, objects can be associated in a variety of ways. This association may be based on a shared characteristic such as color, size, and shape which both objects have in common, on a functional relationship between two objects, or on an inferred characteristic shared by both objects. For example, if you consider a (building) block and a box, the two may be together because both share a common color such as brown, or because both start with a "b" (i.e., descriptive, part-whole style), because the block can be put into the box (i.e., relational style), or because both are toys or are made out of wood (categorical style). Thus, in the process of teaching phonetics, vocabulary, and further characteristics of objects which have become part of the child's vocabulary, the child learns to use certain categories for associating the reference objects, e.g., "block" and "box". The criteria of association correspond exactly to the cognitive styles described earlier, namely descriptive-analytic, relational, and categorical.

The relevance of this study for readiness was that it controlled experimentally the logical relationship between operational criteria of readiness, namely cognitive styles and the methods of language training. Readiness in this case was not conceived of as an ability, but rather as a disposition which might make it possible to individualize language instruction and thereby make language training more efficient. Specifically, by varying the correspondence between the child's preferred cognitive style and the method of language training it was possible to determine the effects of the child's cognitive style (i.e., readiness) on learning (regardless of the method of teaching), the effect of method of language training on learning (regardless of the child's cognitive style), and thirdly, the interreacting effects on learning of both the child's cognitive style and the method with which he is being trained. The outcome of the study demonstrated that readiness in the form of cognitive style and teaching method affected learning or language acquisition both separately and in interaction with one another. Children with a dominantly descriptive style achieved better recognition memory of vocabulary regardless of the methods with which they were taught. Conversely, the descriptive method of language training produced better recognition memory regardless of the child's initial cognitive style. In contrast, children who had a predominantly relational style improved most in their associative memory regardless of the method with which they were taught. Again, the same applied to the relational method of training, regardless of the child's initial cognitive style. Finally, there was a consistent trend for children to achieve better recognition and associative memory whenever the method of training corresponded with the child's cognitive style or readiness.*

Another set of findings in the study was obtained from the use and comparison of performance on the Illinois Test of Psycholinguistic Abilities before and after language training. A major finding relevant for readiness was that matching the child's cognitive style with the method of language training was clearly more effective than non-matching. The second major finding was found in a group of children who could not sufficiently verbalize to be classified with regard to cognitive styles. It was found that these children who were most backward in language development benefited generally more than other children from the functional-relational method of language training.

---

* These findings emerged on a paired associate learning test which was especially constructed to evaluate the effects of cognitive styles (readiness, method of language training and the interaction between the two).

As indicated earlier, this study was discussed here to illustrate research on readiness in which it can be shown that a meaningful relationship exists between the operation of readiness and the method of instruction. A conclusion to be drawn from that study is that individualization of instruction has positive effects on language acquisition.

EMOTIONAL AND MOTIVATIONAL FACTORS IN READINESS

The interrelationship between readiness and method of teaching as well as the need for individualization of instruction can also be found in the case of non-cognitive factors such as emotion, motivation and interpersonal relationships. With regard to the non-cognitive variables of readiness, it should be pointed out that it is often the non-cognitive aspects of teaching or educational methods which must be modified in order to maximize the effectiveness of instruction. In the case of the child who is not ready because of a lack of motivation to learn, it is, of course, indicated first to search for the causes which conflict with the motivation to learn or to be taught. When such factors cannot be found, or cannot be altered, special incentives, contingencies and other non-cognitive factors are introduced into the teaching process to increase motivational readiness for learning. However, when the particular motivational or emotional factors effecting readiness are unclear, then the theoretical or logical basis for introducing special techniques in the educational process remains also obscure. When that happens, the procedure is similar to the use or prescription of drugs which bring about desired changes without an adequate understanding of the processes responsible for the change. Motivational and emotional factors in certain disturbances of readiness to learn, such as "underachievement" and "school phobia" are still too unclear to permit a logical relationship between readiness and individualization of instruction. However, this problem does not exist in all cases of emotional disturbances in readiness. For example, if the problem is one of low self-confidence on the part of the child which results in a poor reaction to the learning situation, it is possible to maximize opportunities for success so as to let the child gradually build up his self-confidence. The problem here is that in spite of the frequent use of the term "self", especially in relation to the disadvantaged child, it is often difficult to assess, let alone measure, self-image and self-confidence.

Considerable progress has been made in the area of interpersonal relationships and their effect on readiness. It has been generally known that lower-class, deprived children approach the formal education situation and the educator with a great deal of fear and mistrust which in turn affects their readiness to learn and perform in this situation. This condition has a similar depressing effect as test anxiety on cognitive performance. (16) The present writer has carried out a study (2) in which, among other things, the effects of this initial apprehensiveness of the disadvantaged child on cognitive performance were investigated. The major purpose of this study was to evaluate the effect of timing of educational intervention in deprived, lower-class children. One group of children began school with nursery at four, a second group began schooling in kindergarten at five, and a third group entered first grade without any prior pre-school experience. These three groups have been compared in a longitudinal study on cognitive and motivational factors and on the interrelationship between these variables. The initial level of intellectual functioning was assessed at the outset for each group. In order to reduce the adverse effects of a new and unfamiliar situation, the situation, the children were given an opportunity to become familiar with the school environment for several months before the initial testing was carried out. It was found that a child's initial IQ score did not vary as a function of the time at which educational intervention was started. In other words, the level of intellectual achievement of nursery children, kindergarten children and first graders in Get Set and ghetto schools as measured by several tests did not differ at the outset when they entered school. Because of uncontrollable circumstances, the same battery of tests had to be given to a group of children immediately after they entered school, that is, within the first three weeks after school entry. This group differed from the other two groups by having a significantly lower performance score on one of the tests, namely the Stanford Binet tests. The inference was made that this deviant finding was due to heightened undissipated apprehensiveness over the new situation. This inference was tested subsequently by selecting a comparable group in the same classrooms and giving them the same test several months after they entered the first grade. The new group performed significantly better than the group which was tested immediately after school entry.

The relevance of this study for readiness was twofold: first, a child's initial level of intellectual performance served as a base line for measuring the effectiveness of educational intervention; thus an artificially depressed initial base line could distort in a variety of ways the obtained change (from pre-to post-testing). Secondly, the emotional component of readiness greatly affected the child's intellectual performance. At least during the initial phase after entering school, the disadvantaged child is apprehensive and this tended to depress his performance. This initial apprehensiveness and its effect on the pre-test, the measure of readiness, dissipated after a relatively short time and with it, the child's intellectual performance rose significantly. Thus, the logic of the relationship between emotional readiness and cognitive functioning was borne out: the apprehensiveness of the child in reaction to a new and strange situation which represents threatening authority, produces generally inhibiting effects, which extends not only into interpersonal behavior, but also to the cognitive realm, at least insofar as performance is concerned.

The same study which yielded the finding described above explored in greater depth the effects of a child's mistrust towards the adult environment and the relationships of such mistrust with other motivational as well as cognitive factors. Mistrust of adults was defined in this study as conflict over turning to the adult for help and emotional support such as praise and affection. The term used for this measure was Dependency Conflict. A meaning of this conflict is that the child is conflicted over making use of the help and nurturance available to him from the adult environment. It is to be expected that such mistrust and conflict will affect behaviors of the child which are expected of him from the teacher. For example, it was found that a heightening of mistrust or dependency confict in a child was associated with both lower motivation to achieve and with lower level of actual achievement. Parenthetically, it sould be noted that measures of motivation to achieve and of actual achievement were obtained from entirely separate sources.

Since this finding was based on several hundred disadvantaged lower-class children enrolled in Nursery, Kindergarten, and First Grade, and since the study extended throughout the entire school year, it would seem safe to conclude that mistrust of the teacher and conflict over turning to the teacher for help and emotional support effects not only the child's readiness to perform but also his readiness to benefit from the educational experience. Whatever the causal relationship might be, it is clear from this set of findings that the disadvantaged child who is not ready to trust the educational situation and the adult educator is also handicapped in other ways, such as in his motivation to achieve and in his readiness to exhibit his abilities when asked to do so in a test situation. Moreover, these readiness factors influence a child not only at the moment of entrance into school, but appear to persist over time in some children as they continue their educational experience in school. This conclusion is not inconsistent with the findings reported earlier, namely that as a whole, children are more apprehensive when they enter a new situation than several months later, after they have had the opportunity to become familiar with the new situation.

Another finding in the same study is of interest. When we compared three groups of children by the end of the first grade, i.e., Group A which had been in school since nursery (three years), Group B since kindergarten (for two years) and Group C, since first grade (for one year), we found that length of time in school was associated with decreasing dependency conflict or mistrust of the educational environment. In other words, by the end of the first grade, the group of children who had been in school for only one year manifested the highest dependency conflict or mistrust of the teacher. The implications of this finding for readiness to benefit from educational experience and the meaning of the relationship between dependency, motivation to achieve and actual intellectual achievement have been discussed earlier. The child who mistrusts the helper and is conflicted over making use of the help available to him is less ready to benefit from the educational process. These findings offer an example of the role of emotional and interpersonal factors as an important part of readiness. A crucial next step for research in this area would be to investigate various modifications in the teaching process that might counteract and overcome the child's mistrust of the educational setting and his conflict over expressing his need for help and support in that situation. Such investigations would appear to be important, not only for the sake of facilitating cognitive development in the child, but also for socialization in other areas. For example, we found that children who were high in dependency conflict also tended to have greater problems than other children in impulse control, particularly in the control of aggression. These continued problems may reflect a lack of readiness on the part of the child to respond to the socializing agent. Thus it would seem that the same forces, both internally and externally, which interfere with the child's readiness to respond to educational processes aimed at developing cognitive functioning also interfere with the child's readiness to respond to the socializing efforts of the educator on impulse control in general and on aggression in particular. However, it should be pointed out that the failure of socialization is often a two-way process. The teacher is no more 'ready' to help the child cope with unacceptable impulses and behavior than the child is 'ready' to respond favorable to attempts by the teacher to help him. This writer has experienced considerable reluctance in a good many nursery and kindergarten teachers of disadvantaged children to recognize and permit the expression of even moderate aggression in the classroom. Thus, one is likely to find less overt expression of aggression in pre-school classes of the disadvantaged child than in pre-school classes of middle-class children. Of course, this does not result in socialization of the child's aggression and other undesirable behaviors, it simply keeps the undesirable behavior out of the classroom. The adult who does not permit the child to express undesirable behavior and who does not help the child to cope differently with frustration and tension does not remove the instigation to such behavior but increases the child's mistrust of himself and adult authority. In a broader sense, the teacher as a socializer has achieved a minor success and a major failure. When the same child who continues to live in the ghetto under many frustrations, approached adolescence, agressive and other undesirable impulses come to the fore again, both in the classroom and away from the classroom. But at that point, the child is less ready to be socialized than he was in pre-school.

SUMMARY

The present paper has offered a brief historical review of the evolution of the concept "readiness". Against this background a formulation of the concept was offered which might serve as a working definition for purposes of research and application. The potential usefulness of this formulation was discussed in the light of Gagne's research on learning sets, Sigel's research on the training for 'conservation' and this author's research on cognitive styles and language training. An extension of the usefulness of the proposed formulation to emotional and motivational factors of readiness was discussed in the light of research carried out by this author on disadvantaged children with regard to apprehensiveness over entering shcool, effects of mistrust and dependency conflict on motivation to learn intellectual achievement and socialization of aggression in the classroom.

BIBLIOGRAPHY

1. Beller, E.K. "Cognitive Styles and Methods of Language Training". Presented at the American Educational Research Association, New York City, February, 1967.

2. Beller, E.K. "The Evaluation of Effects of Early Educational Intervention on Intellectual and Social Development of Lower-Class, Disadvantaged Children". Paper presented at a colloquium for Head Start, Washington, D.C., October 9, 1968.

3. Bruner, S.J. "The Process of Education," Part VII. Cambridge: Harvard University Press, 1960, p. 12.

4. Fowler, W. "Cognitive Learning in Infancy and Childhood," *Psychological Bulletin*, LIX (1962), pp. 116-152.

5. Gagne, R.M. and Paradise, N.E. "Abilities and Learning Sets in Knowledge Acquisition," *Psychological Monographs*, LXXV, No. 14 (1961), pp.1-23 (Whole No. 518).

6. Gagne, R.M., Major,J.R., Garstens, H.L., and Paradise, N.E. "Factors in Acquiring Knowledge of a Mathematical Task." *Psychological Monographs*, LXXVI, No. 7 (1962), pp. 1-21 (Whole No. 516).

7. Gesell, A. "The Ontogenesis of Infant Behavior," *Manual of Child Psychology*, Leonard Carmichael, Ed. New York: John Wiley & Sons, Inc. (1954) pp. 355-356.

8. Hymes, J.L., Jr. *Before the Child Reads*. Evanston, Illinois: Row, Peterson & Co., (1958) p. 28.

9. Ilg, F.L., and Ames, L.B. School Readiness: *Behavior Test Used at the Gesell Institute*, New York: Harper & Row (1964), p.6, p. 14.

10. Kagan, J., Moss, H.A., and Sigel, I.E. "The Psychological Significance of Styles of Conceptualiztion." *Mono. Soc. Res. in Child Dev.*, Vol. 28, No. 2, Serial No. 86, 1963.

11. Kessen, W. *The Child* New York: John Wiley & Sons, Inc. (1965)

12. Montessori, M. *Dr. Montessori's Own Handbook*, New York: Frederick H. Stokes Co., (1914).

13. Heafford, R.M. *Pestalozzi*. London: Methuen & Co., Ltd., (1967).

14. Piaget, J. *The Origins of Intelligence in Children*. New York: International University Press (1952).

15. Rousseau, J.J. *Emile ou de l'education.* Paris: Farnier Freres (1964) p. 83.

16. Sarason, S.B. et al., *Anxiety in Elementary School Children.* New York: John Wiley & Sons, Inc. (1960).

17. Sigel, I.E. "The Piagetian System and the World of Education". In David Elkind, John H. Flavell (Eds.) *Studies in Cognitive Development; Essays in Honor of Jean Piaget.* New York: Oxford University Press, (1969), pp. 465-489.

18. Sigel, I.E. and Olmstead,P. "Modification of Classification, Competence and Level of Representation among Lower-Class Negro Kindergarten Children". In Passow, H.A. (Ed.) *Reaching the Disadvantaged Learner,* New York: Columbia University Teachers College Press, (In Press).

19. Tyler, F.T. "Issues Related to Readiness to Learn" in Ernest Hilgard (Ed.) *National Society for the Study of Education*, Vol. 63, Part I. Chicago: University of Chicago Press, (1964), pp. 210-239.

Study II

Use of Multiple Criteria to Evaluate Effects of Early Educational Intervention on Subsequent School Performance

Problem. Our study of the effects of timing of educational intervention was designed to compare short and long range effects on three groups of children: Group 1, consisting of children who entered a nursery program around age four or five; Group 2, consisting of children who entered kindergarten without any prior nursery experience; and Group 3, consisting of children who entered first grade without any prior preschool experience. These children all came from the same four schools, which were located in a large urban ghetto of North Philadelphia. The children from the three groups were matched as much as possible in age and sex in addition to their common environmental background. Most children came from lower-class black families. In order to provide multiple criteria for the evaluation of changes in cognitive development, three different tests were employed: the Stanford-Binet Test of Intelligence, the Goodenough Draw-a-Man Test, and the Peabody Picture Vocabulary Test. All three tests were administered individually and the team of testers, which consisted usually of an equal number of white male and female testers, changed from year to year so that the children were tested each year by a different group of testers who did not know to which group a child belonged. In addition to the scores on these three tests, we collected class marks on individual subjects for each child after he entered first grade. During the third and fourth grade, we were able to add scores on standardized achievement tests, such as the Science Research Associates Test, the Stanford Achievement Test, and the Iowa Tests of Basic Skills.

Measures of a child's emotional and motivational functioning were obtained during nursery, kindergarten, and first grade and a new set of measures during the fourth grade.

Subjects. Group 1 consisted of 55 children, 31 boys and 24 girls, 4 years, 8 months of age at time of first testing, who were enrolled in four experimental Get Set classes. Each of the four classes was located in a different school and all four schools were located in a large urban ghetto of North Philadelphia. Group 2 consisted of 53 kindergarten children, 29 boys and 24 girls, 5 years and 10 months of age, who were drawn from the same four schools and the same kindergarten classrooms attended by children from Group 1. The children in Group 2 were selected so as to match the children in Group 1 in age and sex composition. Group 3 consisted of 58 first grade children, 27 boys and 31 girls, 6 years and 3 months of age, who attended the same four schools as Groups 1 and 2. Ninety-two per cent of the children came from lower class families. Again, these children were selected on the basis of matching Groups 1 and 2 in age and in sex composition.* Our follow-up study is now in its sixth year and all of the three groups of children have been studies annually for each of five years. The children have just completed fourth grade. As of this moment, we have 88 per cent of the original sample, that is, an attrition of only 12 per cent for a period of five years. Although the children are now spread over more than seventy schools in the city of Philadelphia, each child has been followed up individually from year to year.

---

*Group 3 was younger at the time of testing because the children in this group were tested five to seven months earlier in the school year than the children of Groups 1 and 2. Also, more girls were needed to equalize the age factor.

Procedure. Multiple criteria were employed to evaluate the impact of early educational intervention. For purposes of measuring intellectual performance, three tests were employed: the Stanford-Binet Test, the Peabody Picture Vocabulary Test and the Goodenough Draw-a-Man Test. To measure academic achievement, class marks were obtained for each grade. During the third and fourth grades, standardized achievement scores were obtained for each child, based on one of three tests: the Science Research Associates Test, the Stanford Achievement Test and the Iowa Tests of Basic Skills.

Measures of emotional functioning and of motivation were obtained from nursery through the first grade: dependency motivation, dependency conflict, autonomous achievement striving and aggression. Children were also rated on their emotional reactions and their motivation in the testing situations. All of these measures have been described in some detail in previous annual reports. Four new measures which have been introduced in the fourth grade and have never been mentioned before will be described now in some detail.

We have introduced four new variables in our study of these children during this past year. These variables were chosen for their potential to add meaning to patterns in our data, especially over time. All the new variables deal with motivational, emotional, and social factors. Our new motivational measure was based on a child's response to different conditions for learning. A cognitive learning task was administered to each child under conditions of intrinsic and extrinsic reinforcement. In the first case, namely under intrinsic reinforcement, the child is expected to make the learning process a self-rewarding one. In the second, namely under extrinsic reinforcement, the child depends heavily on the adult both for obtaining the relevant cues and for emotional support. These learning tasks are designed in greater detail in Study III. A measure of self-concept by means of a test called "The Way I Feel About Myself," constructed by Piers and Harris, was obtained to get some data on the child's perception of himself and his feelings toward himself. The third new measure was the impulsive-reflective test constructed by Kagan. The fourth new measure was a Piaget-type interview with each of the children to determine the maturity of their moral judgment.

As indicated above, these four variables were introduced into the study because of their potential to add further meaning to the pattern of our data and to support or put into question some of our interpretations. For example, the self-concept measure might be related to decline over time in the Draw-a-Man scores. The impulsive-reflective measure might relate to individual differences in a child's ability to gain from his educational experience. The same may be true for a child's relative functioning on the conditions of intrinsic reinforcement versus extrinsic reinforcement. That is, it is possible that children who gain from their educational experience and who maintain a high level of performance will be those who function better than others on the learning task under intrinsic reinforcement. Finally, both the self-concept measure and the maturity of moral judgment relate to a child's progress in school. A very similar type of analysis will be pursued with motivational measures of dependency and autonomous achievement striving which we had obtained on all children in our three groups during kindergarten and first grade. Of course, the latter measures will have greater predictive value than the new ones, which we have just introduced recently.

Overall analyses of our data are currently being planned. The major analysis will deal with variability over time and direction of change. An item analysis will be carried out, especially on the Stanford-Binet, to determine on which items our three groups of children progressed and on which other items they failed to show the same degree of development. Stability and fluctuation over time, as well as directional change, will be related to our emotional and motivational variables, which have been measured from nursery through the first grade and then again in the fourth grade.

Results. Although we have not yet started our overall analysis of the data, or even the analysis of the most recent data that have come in, we are including Table 1, which was prepared especially for this report. Before commenting on the contents of the table, we wish to make a methodological note. During the past year, our total set of Draw-a-Man tests were rescored in order to make sure that unmistakeable trend of decrease over time was not a function of different scores in different years. Inspection of Table 1 shows that after some initial rise, the Stanford-Binet scores show an amazing consistency over time for each of the groups, and therefore the same discrepancy between the three groups. Group 1, who had the longest educational background (that is, they started with nursery), stays ahead of the other two groups while children from Group 3, who entered first grade without any preschool experience, remain consistently below the other two groups. The scores on the Peabody Picture Vocabulary Test reveal a similar pattern. Scores are consistent over time, the order of the three groups is always in the predicted direction, but much smaller than under Stanford-Binet tests. Moreover, two groups (1 and 2) show a small but steady increase over the years on this test. The scores on the Draw-a-Man Test reveal a quite different pattern. After an initial rise in the first grade, the children's performance on this test has been steadily declining. It is interesting to note that the rate of decline has been slowest in Group 1, which started school earliest, and fastest in Group 3, which started school later than the other two groups. Group 2, which is intermediate between 1 and 3 in terms of the length of their educational experience, remains consistently in a middle position between these two extreme groups. As we have pointed out in the previous Annual Report, the decline of scores on the Draw-a-Man Test and not on the other two tests suggests that this test might reflect changes in self image.

MEAN SCORES ON THREE MEASURES OF INTELLIGENCE (STANFORD BINET TEST, GOODENOUGH DRAW A MAN TEST, AND THE PEABODY PICTURE VOCABULARY TEST) FOR THREE GROUPS OF CHILDREN (GROUP I HAD NURSERY AND KINDERGARTEN, GROUP II HAD KINDERGARTEN ONLY AND GROUP III HAD NEITHER NURSERY NOR KINDERGARTEN) ON FIVE GRADE LEVELS

GROUPS	GRADE LEVEL											
	N	NURSERY	N	KINDER-GARTEN	N	FIRST GRADE	N	SECOND GRADE	N	THIRD GRADE	N	FOURTH GRADE
					Stanford Binet							
I	(55)	92.4+	(54)	98.8	(40)*	98.7	(51)	98.0	(45)	97.6	(50)	98.4
II			(53)	91.2	(52)	94.7	(50)	92.8	(46)	93.1	(45)	92.1
III			(58)	85.8	(56)	89.8	(55)	88.6	(51)	89.0	(53)	88.9
					Draw A Man							
I	(56)	97.1+	(50)	96.9	(46)	100.5	(46)	99.5	(44)	95.0	(50)	96.0
II			(53)	96.8	(53)	98.4	(48)	94.3	(47)	90.8	(46)	91.6
III			(58)	91.0	(57)	98.3	(55)	92.2	(53)	87.2	(53)	85.6
					Peabody Picture Vocabulary							
I			(47)	84.5	(39)	89.8	(51)	88.8	(46)	89.9	(50)	91.8
II			(45)	79.4	(52)	85.6	(50)	88.9	(45)	89.0	(46)	88.1
III			(58)	74.5	(55)	82.4	(55)	84.2	(51)	84.7	(53)	84.9

* We were able to recover 13 more children from this group for the retesting a year later.

+ These scores were available for Group I.

Study III

The Effects of Nurturance Deprivation in Lower Class Black Children: Part II

Problem. The original study included in last year's Annual Report was carried out to investigate whether children with more deprived home backgrounds would respond differently to experimentally-induced deprivation than children with less deprived home backgrounds. Two alternative hypotheses were at issue: will a child with a deprived home background be more sensitized or more desensitized to renewed experiences of deprivation? The outcome of the study seemed to support the first alternative. Children who came from a more deprived home background performed better on a learning task after an increasing amount of induced experimental deprivation. Children from a less deprived home background did not respond at all to the induced experimental deprivation, but performed better under the no-deprivation condition than the group with a greater background deprivation. Thus, the hypothesis that background deprivation sensitizes rather than desensitizes a child to renewed experiences of deprivation was clearly borne out by our data. Since this finding was of considerable theoretical as well as practical importance, we undertook a replication of the study.

The replication study had three modifications. The first modification was to limit variation in amount of experimentally-induced deprivation from five intervals to three intervals. This change was indicated by the fact that original findings could be described as well by three points as by five points on the dimension of increased experimental deprivation. The second change in the new study has been to enlarge the design and number of subjects by adding control groups for each of our experimental groups. Although the amount or length of induced deprivation was carefully controlled in the original study, we did not employ an equal set of non-depriving experiences for the child to parallel the periods of increasing deprivation. The absence of this control group in the first study raised a question which could not be answered from that study of whether the increased effectiveness of the experimentally-induced deprivation in the high background-deprived group was due to longer periods of deprivation or to longer periods of interaction between experimenter and child, which enabled the child to get adapted to this new situation. The third modification was in the criterion for high and low background deprivation. In the original study, we divided the children above and below median and considered those above median as high background deprivation and those below median as low background deprivation. For the replication study we took a larger sample to begin with, and selected the upper and lower third of the range for our two background deprivation groups. It is evident that this procedure both clarifies and limits the generalization to be made from the findings. Except for these modifications, the replication study was identical with the original study in sampling of subjects, in the measurement of background deprivation, and in all experimental procedures.

Subjects. As in the original study, the subjects consist entirely of lower-class, first grade black boys and the experimenter is again a black female, although not the same person as in the original study. The original number of subjects from whom the low and high background deprived samples were selected consisted of 374 first grade, lower-class black boys. The children were from 28 first grade classrooms in five schools located in a large urban ghetto of North Philadelphia.

Procedure. Two scales were employed to determine the degree of background deprivation of the child. Each child was rated on a seven-point continuum with regard to the frequency with which a child came to school tired, hungry, and poorly dressed, i.e., neglect to care. The second scale was designed to measure how frequently a parent showed an interest in the child's progress in school as determined by response to messages to the parent, attendance at parent-teacher conferences, and voluntary inquiry about the child's conduct and progress in the classroom, i.e., disinterest to interest. Details of these scales are given in last year's Annual Report, page 111. A high and low background deprived group was selected. The high background deprived group consisted of the upper third of the distribution, based on the average of the two scales. The lower background deprived group consisted of the lower third of the distribution based on the average of the two scales. Each group consisted of one hundred twenty children. The children from each of these two groups were then assigned randomly to increasing periods of experimentally-induced deprivation, that is, zero, ten, and twenty minutes of attention withdrawal and the other half to zero, ten and twenty minutes non-deprived contact with the experimenter preceding the problem-solving learning task. Finally, 50 per cent in each of the twelve subgroups were assigned to an intrinsic non-social reinforcement condition for the learning phase, and the other 50 per cent to an extrinsic social reinforcement condition for the learning phase. The total design therefore, was a 2 x 2 x 3 x 2 factorial design for analysis of variance.

Induced Deprivation: Each child was taken by an adult experimenter, a Negro woman, to the testing room. During the trup from classroom to testing room, minimal but positive social interaction was afforded. After entering the testing room, the experimenter found a note reminding her to make a telephone call. She instructed the child to wait until she completed her telephone call. The adult then went through a simulated telephone conversation of random comments, ignoring the child completely for 10 or 20 minutes. The child was left seated without any toys to offer substitute gratification for the attention withdrawal. Immediately following the period of nurturance deprivation, the experimenter initiated a problem-solving learning task. For those children who received no attention withdrawal, the problem-solving task was initiated immediately upon entering the testing room.

The Problem-Solving Task: The problem consisted of finding an object hidden under one of three boxes that differed from one another only in size. The principle for the solution was that the object was always hidden under the middle-sized box. The child was told:

> There is a *way* you can always tell which box it it is hidden under. I *always* put it under the correct box.

The experimenter permitted the child to correct errors on each trial. The boxes were presented in a standardized random order on thirty successive trials.

Conditions of Reinforcement: The learning task was presented under two conditions: Social reinforcement and no social reinforcement. Under the condition of social or extrinsic reinforcement, the child was asked to point to the box which hid the object. The child was informed by the adult whether his pointing response was correct or incorrect. When his response was incorrect, he was encouraged to try again and when he made the correct response, he received confirmation and verbal praise for his achievement, consisting of the comments, "good," and "very good." Under the condition of intrinsic or no social reinforcement, the child was encouraged to pick up the box and see for himself whether his response was correct or not. Once he made the right response and discovered the object, he received no other reinforcement. That is, in the intrinsic condition, the child had to rely on the perception of his own performance to discover the correct solution. The experimenter was trained to provide as little social reinforcement as possible in terms of such behavior as gestures, smiles, etc., under the intrinsic condition. Whereas under the extrinsic condition, when the child made a correct response, the experimenter not only provided the verbal responses, but indicated her approval through broad smiling and other facial and body gestures. The children were assigned randomly to the two conditions of reinforcement. Thus, the final design consisted of two degrees of background deprivation, five periods of induced deprivation, and two conditions of reinforcement. The dependent variable was the number of errors made in each block of five trials.

Results Although our data collection is not completed, we plotted, for purposes of the present report, the findings as of this moment. Figure 1 represents the replication of the first and second study with regard to the deprivation condition. It can be seen that the effect of increasing intervals of deprivation on the high background-deprived children is extremely similar in the two studies. The only difference is a sharper effect of the maximum deprivation period in the new study but in exactly the same direction. With regard to the low background-deprived group, we also find great

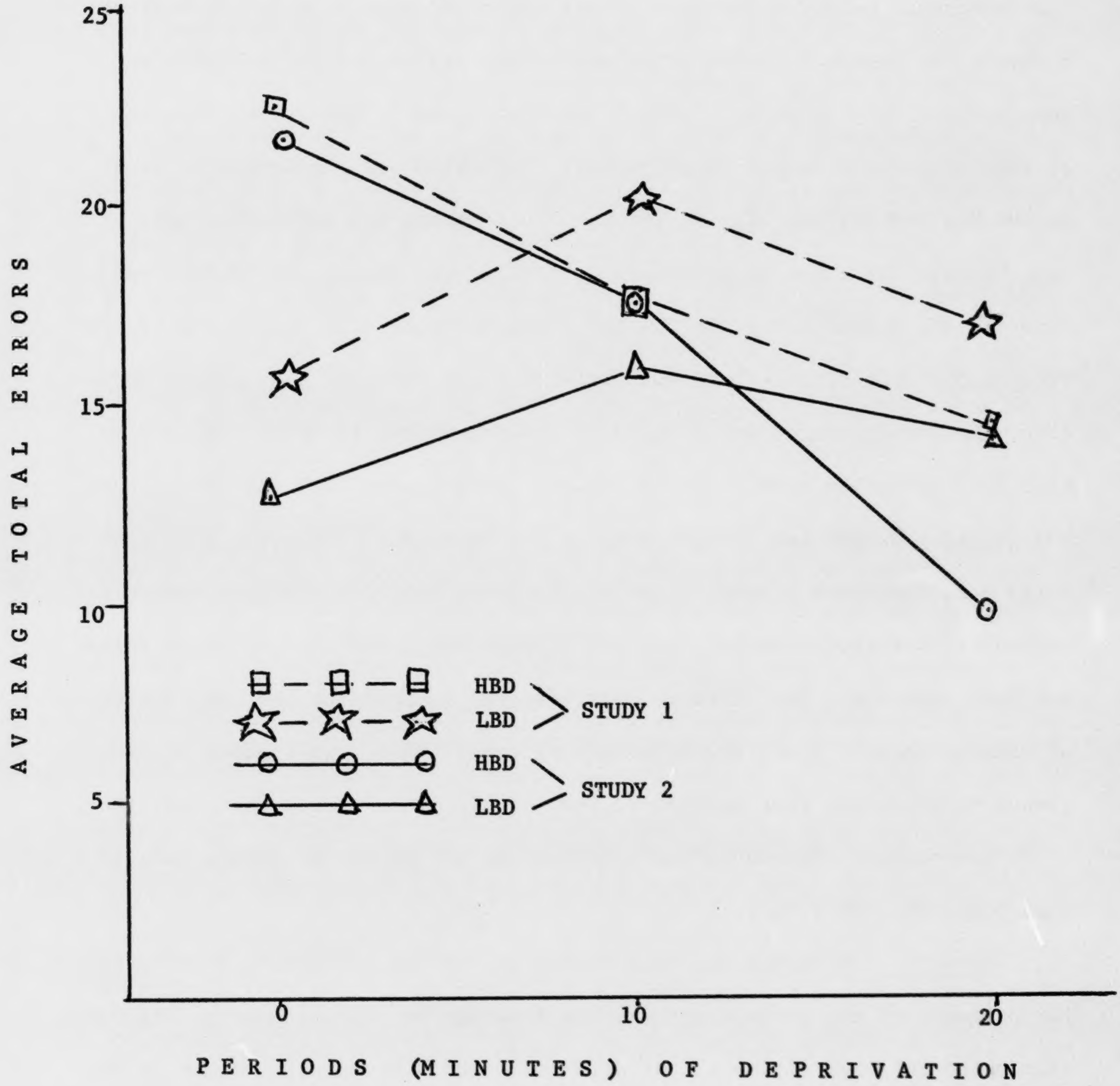


Figure 1. Average number of total errors over thirty trials in high (HBD) and low (LBD) background deprived children after 0-, 10-, and 20-minute periods of experimentally-induced nurturance deprivation in two studies.

similarity in the findings from the two studies. The direction of change from zero to ten to twenty minute periods of deprivation is exactly the same. However, the low-background-deprived children in the new study performed consistently better under all conditions of deprivation. At the moment, we would ascribe this difference to the fact that we have selected a less background-deprived group in the replication study by limiting ourselves to the lower third of the background-deprivation dimension. These children are probably lower on background deprivation than the first group, and therefore perform better generally.

The findings presented in Figure 2 are limited to the second study. The graphs for the experimental deprivation conditions are the same as those in Figure 1. The two additional graphs in this Figure are based on the performance of high-- and low-background-deprived children under the control conditions, that is, increasing periods of nondepriving contact between the child and the experimenter prior to the learning task. It is clear from inspection of the Figure that there is a pronounced difference between the experimental and control condition for the high-background-deprived children. Only the experimental groups show an increasing improvement performance, that is, fewer errors as deprivation increases. The control group fails to show any such trend. In other words, when the contact between the experimenter and the child is a nondepriving one, increased periods of contact do not yield such changes in performance.

When we turn to a comparison of the low-background-deprived groups, under the experimental and control conditions, we find again that the experimental conditions and the control conditions appear to yield different patterns of change. The largest point of difference between the two conditions

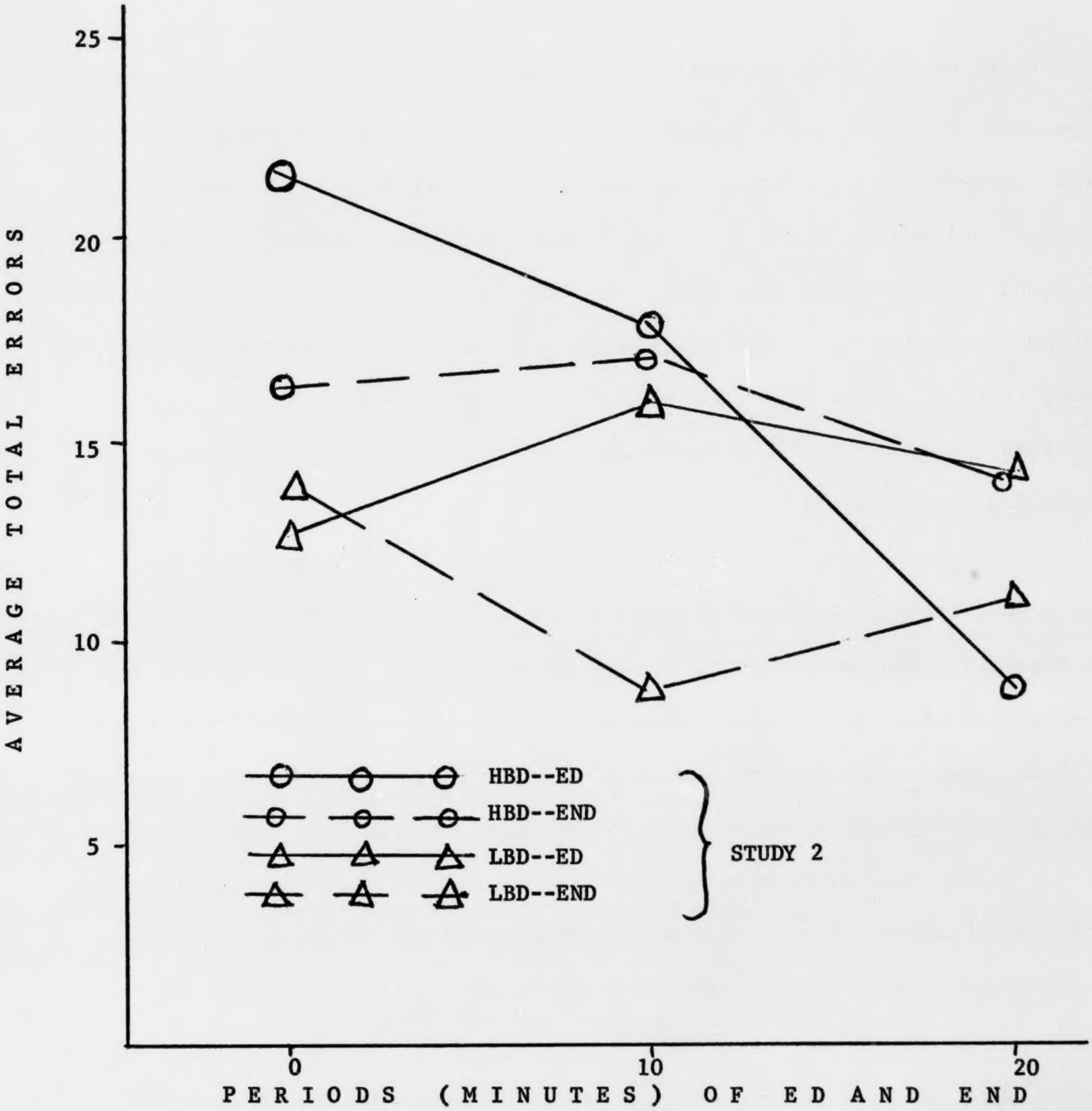


Figure 2. Average number of total errors over thirty trials in high (HBD) and low (LBD) background deprived children after 0-, 10-, and 20-minute periods of experimentally-induced nurturance deprivation (ED) and equal periods of no deprivation (END).

shows up at the ten-minute period of deprivation versus no deprivation preceding the learning task. It seems that children from more nurturant and less deprived backgrounds respond more favorably to nondepriving contact with the experimenter than to depriving contact. Since these findings are not complete, we shall resist the temptation to interpret them. However, it is clear that so far the replication study is bearing out the original study: a background of home deprivation sensitizes, rather than desensitizes, a child to renewed experiences of deprivation.

As in the original study, we obtained I.Q. scores for all children in our replication study. In the new study, we also obtained scores of field dependence and of impulsivity. Analysis of the incomplete data shows a highly significant difference between the high and low background deprived groups on all three variables. Children coming from a background of home deprivation have significantly lower I.Q.'s, higher field dependence and impulsivity scores.

We hope to complete the replication study during the latter part of the fall after the children have settled back into the school situation. A final report of the findings of the replication study should be available sometime during 1970.

Study IV-A

A Developmental Study of the Effects of Different Types of Reinforcement on Problem-Solving in Children

Problem. We have carried out an extensive investigation of the effectiveness of different conditions of reinforcement on the learning of cognitive tasks in children from nursery through the third grade. The purpose of this study was to determine how effectiveness of different conditions of reinforcement on the learning of cognitive tasks was affected by the ethnic identity and social class background of children. Therefore, ethnic identity (black versus white), social class, the age and sex of the child, and the sex and ethnic identity of the experimenter were controlled so that each characteristic was equally represented in the study. The second objective of the present study was to determine the effect of certain personality characteristics of the child, such as field dependence and impulsivity, on the effectiveness of different conditions of reinforcement in the learning of cognitive tasks in children.

Subjects. Children were selected randomly within the proper age ranges as much as possible from integrated classrooms. Thus, the basic design was 2 x 2 x 2 x 4 x 5 design. Since we also controlled precisely for sex and ethnic identity of the experimenters, another two factors (2 x 2) were added. The minimum number of children necessary to fill this design were 640, and this was the size of our sample. From kindergarten and up, the children were selected from integrated public elementary schools. Three of these schools were located in an urban ghetto, and three in a middle-class residential area. Table 1 gives the breakdown of schools, classrooms and age ranges from which children were selected for the present study. The nursery children had to be selected mostly from segregated nursery schools since only one integrated nursery was available with an equal balance of white and black children.

Procedure. The experimental task and the four conditions of reinforcement are described in some detail in the following section (Study IV-B) in which a small segment of the larger study was repeated and analyzed for a special purpose.

The two major dimensions of reinforcement in the present study were extrinsic versus intrinsic and social versus nonsocial. In the extrinsis condition, the cue and/or reward comes from an external source and is superimposed on the task rather than being an essential part of the task. In the intrinsic condition, the relevant cue and/or reward is an essential part of the task and is produced by the subject himself in his effort to solve the problem or perform the task. The social - non-social dimension of the reinforcement differed in that under the social reinforcement condition the source of reward and/or cue was always a person, whereas under the nonsocial condition the source of reward and/or cue was always a nonsocial stimulus. The two major dimensions were extracted from four specific conditions of reinforcement each of which combined components from the two different dimensions. The four conditions were: extrinsic social, extrinsic nonsocial, intrinsic social and intrinsic nonsocial. Each of the four conditions will be described after a description of the learning task.

The learning task involved size discrimination. A die was hidden under one of three boxes, which were identical in all other respects except size. The die was always hidden under the middle-sized box and the right to left order of the three boxes varied from trial to trial, according to a prearranged randomized order. At the start of the experimental task, the child was instructed to guess which of the three boxes hides the die. He was told that there was a way to guess each time which box hides the die, since the die was always hidden under the same box. The subject was also instructed that it was important to guess the correct box on his first try. Each subject received thirty trials. After every fifth trial, each child was reminded that there was a way to find the die on his first try. Each trial continued until the child found the correct box. Since there were three boxes and the die was always hidden under one, the child could make two errors on any one trial before he guessed the correct box. When the child made the wrong guess, he was always told to try another one. The child continued either to a criterion of six successive errorless trials or to the completion of thirty trials. Two scores were computed: one based on the total number of errors over trials and the second on six blocks of five trials each.

Under the two extrinsic conditions of reinforcement, the child was asked to point to the correct box which hides the die. After pointing, he received a signal either from the experimenter or from a nonsocial source, which indicated the correctness of his choice. Although the child was always shown at the beginning that the die was actually hidden under one of the boxes, he was reminded not to pick up the box but only to point to the correct box. This procedure was used to maximize S's dependence on an external source which was extrinsic to the task. When he pointed to the incorrect box, he was always encouraged to try another one. Under the extrinsic social condition, when the child pointed to the correct box, the experimenter said, "That is it," "Very good," "Good try," etc. Under the extrinsic nonsocial reinforcement condition, a light was used to indicate the correctness of the child's choice. The child was told in the beginning that the appearance of the light would indicate the correctness of his choice.

Under the intrinsic condition, the child was instructed to pick up the box in order to determine the correctness of his choice. If the child found nothing under the box, that is, if his choice were incorrect, he was told to try another box. Under the intrinsic social condition, the child was encouraged to pick up the box he thought was the correct one. If the child picked up the wrong box, he was encouraged to try another one. After the child had picked up the correct box, and had perceived the correctness of his choice, the experimenter complimented him with praise, such as "Good guess," "Very good," adding a warm smile each time. In the intrinsic nonsocial condition the child was encouraged to pick up the correct box, but after he had picked up the correct box and perceived the correctness of his choice by discovering the hidden object, he received no other reinforcement from the experimenter. Thus, the reinforcement was an intrinsic part of the task.

The four conditions of reinforcement enabled us to extract two major dimensions of extrinsic - intrinsic and social - nonsocial reinforcement.

The experimenters consisted of two white males, two white female, two black male and two black female adults. Each pair was equally represented in all experimental conditions.

In order to enhance the understanding and interpretation of our findings, we obtained measures on three additional variables: I.Q. (the Peabody Picture Vocabulary Test), field dependence (two Embedded Figure Tests, modified for children, one by Karp and the other by Susan Coates), and impulsivity (the "Draw A Line Slowly Test" used by E. Maccoby). The order of administration of these tests and of the learning experiment were controlled so as to avoid a bias in the case of order effect.

A questionnaire was construced to measure socioeconomic status (SES), and was answered by 41 per cent of the parents from kindergarten to third grade children. A copy of the instrument is enclosed in Appendix A. We are still trying to get more of these measures on the parents of our subjects.

Results. Although we expect to get data on more parents of our S's, we have carried out a preliminary analysis of the questionnaire for the purpose of the present report. This analysis has shown that of 10 indices, all yielded significant differences between social class ($p < .05$). Within social class, two of the 10 indices were significant between whites and blacks within the middle class. Middle-class fathers (white) had significantly more years of education ($t = 5.50$, d.f. = 107, $p < .01$) and white middle-class fathers were significantly higher on occupational index than black middle-class fathers ($t = 2.75$, d.f. = 107, $p < .01$). There were no other significant differences between white and black fathers and mothers. Only one out of 10 comparisons yielded a significant difference ($z = 2.74$, $p < .01$) between white and black lower-class families. Thirty-nine per cent lower-class black children came from father absent home, whereas only 13 per cent lower-class white children came from father absent homes. As indicated earlier, these findings were based on an incomplete sample, and are therefore only tentative and suggestive.

The detailed analysis of the data collected in the reinforcement study is currently underway but not yet ready for reporting. However, for the purposes of the present report, two overall analyses were carried out. The outcome of these analyses are presented in Tables 2 and 3. It can be seen from Table 2 that performance on the problem-solving task was significantly affected, not only by age (G), but also by the ethnic identity (E) and social class (C) of the child. These factors also affected the learning of the child; this can be seen by the interactions between ethnic identity (EB), social class (CB) and grade (GB) with blocks of trials. Social class also interacts with the age of the child in its effect on performance and in its effect on learning as can be seen from the CG and CGB interactions. Finally, of the two major dimensions of reinforcement, the extrinsic - intrinsic dimension (R) is significant as a main effect and interacts significantly with the ethnic identity and social class (ECRB) on the learning of the child. The interacting effect of ethnic identity, social class, reinforcement with the age of the child (ECGRB) comes sufficiently close to significance in its effect on learning to warrant closer scrutiny. The second dimension of social - nonsocial reinforcement (S) is neither significant as a main effect, nor does it interact with any of the other conditions. Thus, it appears that major factors which have been controlled in the present study do affect performance in learning of a cognitive task in children from four to nine years of age. It is interesting that of the two major dimensions of reinforcement, the distinction between extrinsic and intrinsic is clearly more important than the distinction between social and nonsocial which has been used as the main distinction in a good many studies on the role of reinforcement in the learning of children.

In the second overall analysis, which was carried out for the purposes of the present report, we dealth with the effects of ethnic identity, social class, sex and age of the child and ethnic identity and sex of the experimenter on the performance of a problem-solving task in children between four and nine years of age. Inspection of Table 3 shows that social class and age of the child again emerge as significant main effects and interact with each other. With regard to ethnic identity and sex of child and examiner, only the ethnic identity of both the experimenter and the child emerge as significant factors. Sex of the child and sex of experimenter do not emerge as significant main effects. Ethnic identity and sex of examiner interact in their effect on problem-solving in children. Finally, age of child interacts with the ethnic identity of the examiner and with the social class and sex of the child in their effect on problem-solving behavior in our children. It is interesting that while sex of child did not emerge as a main effect, it does interact with social class as a factor in its effect in the present study. The major conclusion to be drawn from the present table would seem to be that control of the experimental characteristics such as ethnic identity and sex of experimenter are important variables to control in studies investigating the learning of cognitive tasks in children between four and nine years of age.

We have refrained from giving more detailed information concerning the direction of these factors reported in Tables 2 and 3 because more detailed analyses are in progress which, when complete, will enable us to make a more comprehensive and meaningful statement of our findings. However, these overall analyses which were especially prepared for this report give some indication of the general direction of our findings.

TABLE 1

SCHOOLS, CLASSROOMS AND AGE RANGES FROM WHICH LOWER AND MIDDLE-CLASS WHITE AND BLACK CHILDREN WERE SELECTED FOR THE REINFORCEMENT STUDY

	GROUPS	NUMBER OF SCHOOLS	NUMBER OF CLASSROOMS	AGE RANGE
LOWER CLASS	Nursery	8	15	48-59 mos.
	Kindergarten	2	6	60-71 mos.
	First Grade	2	6	72-83 mos.
	Second Grade	3	8	84-95 mos.
	Third Grade	3	8	96-107 mos.
MIDDLE CLASS	Nursery	10	13	48-59 mos.
	Kindergarten	3	5	60-71 mos.
	First Grade	2	6	72-83 mos.
	Second Grade	2	5	84-95 mos.
	Third Grade	2	7	96-107 mos.

TABLE 2

ANALYSIS OF VARIANCE FOR ERRORS OVER 30 TRIALS BASED ON 640 CHILDREN FROM NURSERY THROUGH THIRD GRADE

+SOURCE	DEGREES OF FREEDOM	MEAN SQUARES	F	
E	1	585.9375	28.09	**
C	1	1203.7760	57.71	**
G	4	432.6632	20.74	**
R	1	120.4167	5.77	**
S	1	41.6667		
B	5	439.5162	21.07	**
EC	1	.0844		
EG	4	15.9355		
CG	4	91.7754	4.40	**
ER	1	1.6667		
CR	1	3.8760		
GR	4	16.7507		
ES	1	7.0042		
CS	1	.3760		
GS	4	28.7454		
RS	1	31.5375		
EB	5	9.3050	3.22	**
CB	5	10.3248	3.57	**
GB	20	11.1896	3.87	**
RB	5	.6279		
SB	5	1.8317		
ECG	4	4.5212		
ECR	1	17.3344		
EGR	4	31.8704		
CGR	4	11.2764		
ECS	1	5.8594		
EGS	4	33.4059		
CGS	4	11.9483		
ERS	1	1.3500		
CRS	1	31.1760		
GRS	4	19.0798		
ECB	5	1.0744		
EGB	20	3.3554		
CGB	20	5.7405	1.99	**
ERB	5	2.2242		
CRB	5	2.1623		
GRB	20	1.1517		
ESB	5	.2704		
CSB	5	1.5410		
GSB	20	2.0847		
RSB	5	2.2775		
ECGR	4	12.7999		
ECGS	4	6.5384		
ECRS	1	23.1260		
EGRS	4	29.6085		

SOURCE	DEGREES OF FREEDOM	MEAN SQUARES	F	
CGRS	4	30.3525		
ECGB	20	2.8448		
ECRB	5	7.0794	2.45	**
EGRB	20	1.5850		
CGRB	20	2.7994		
ECSB	5	1.9631		
EGSB	20	2.6854		
CGSB	20	2.6594		
ERSB	5	2.0587		
CRSB	5	1.5060		
GRSB	20	2.9706		
ECGRS	4	15.6306		
ECGRB	20	4.4613	1.54	†
ECGSB	20	1.0648		
ECRSB	5	1.0423		
EGRSB	20	3.0571		
CGRSB	20	2.7895		
P(ECGRS)	560	20.8598		
ECGRSB	20	1.3554		
PB(ECGRS)	2800	2.8892		

+
E = ethnic identity (white vs. black)
C = social class (middle vs. lower)
G = 5 grade levels (nursery through third grade)
R = extrinsic vs. intrinsic reinforcement
S = social vs. non-social reinforcement
B = blocks of trials

** $p < .01$
† F =1.57, $p \leq .05$

TABLE 3

ANALYSIS OF VARIANCE FOR EFFECTS OF ETHNIC IDENTITY AND SEX OF EXPERIMENTERS AND OF CHILDREN ON TOTAL ERRORS OVER 30 TRIALS

+ SOURCE	DEGREES OF FREEDOM	MEAN SQUARES	F	
C	1	2421.9141	22.19	**
G	4	6647.0234	60.90	**
R	1	298.3891	2.73	*
S	1	229.2016		
E	1	2524.1266	23.13	**
X	1	236.4391		
CG	4	2332.9375	21.37	**
CR	1	290.2516		
GR	4	278.8500	2.55	*
CS	1	.8266		
GS	4	49.6469		
RS	1	1977.5391	18.12	**
CE	1	68.2516		
GE	4	73.7594		
RE	1	17.2266		
SE	1	12.9391		
CX	1	.2641		
GX	4	156.5797		
RX	1	298.3891		
SX	1	1.9141		
EX	1	73.5766		
CGR	4	45.5953		
CGS	4	148.4984		
CRS	1	53.4766		
GRS	4	175.3828		
CGE	4	68.2672		
CRE	1	70.8891		
GRE	4	71.5859		
CSE	1	46.7641		
GSE	4	43.9234		
RSE	1	26.0016		
CGX	4	271.9437	2.50	*
CRX	1	301.1266		
GRX	4	216.4125		
CSX	1	5.4391		
GSX	4	90.9687		
RSX	1	16.5766		

+SOURCE	DEGREES OF FREEDOM	MEAN SOUARES	F
CEX	1	2.3766	
GEX	4	41.3656	
REX	1	10.2516	
SEX	1	.4516	
CGRS	4	190.7656	
CGRE	4	23.1312	
CGSE	4	35.6000	
CRSE	1	173.2641	
GRSE	4	54.3531	
CGRX	4	111.8453	
CGSX	4	144.0641	
CRSX	1	100.0141	
GRSX	4	213.2172	
CGEX	4	57.5172	
CREX	1	74.9391	
GREX	4	62.2984	
CSEX	1	282.2266	
GSEX	4	174.9828	
RSEX	1	51.1891	
CGRSE	4	90.4047	
CGRSX	4	73.8812	
CGREX	4	89.7125	
CGSEX	4	55.2969	
CRSEX	1	334.9516	
GRSEX	4	159.0250	
CGRSEX	4	34.0141	
P(CGRSEX)	480	109.1464	

+ C = Social class of child
G = Age of child
R = Ethnic identity of experimenter
S = Sex of experimenter
E = Ethnic identity of child
X = Sex of child

** $p < .01$ = 6.63 (df=1); 3.32 (df=4)
* $p < .05$ = 3.84 (df=1); 2.37 (df=4)

Study IV-B

Relative Effectiveness of Candy as a Reinforcement Condition on Problem-Solving in Lower-Class Preschool Children*

Problem. Candy has been used over a good many years as a major reward in studies with young children. In most instances its effectiveness as a reinforcer was taken for granted. Only a few investigations have examined the effectiveness of candy as a reinforcer by comparing it systematically with other methods of reinforcement. (Spence, J. T., and Segner, L. L., 1967; Terrell, G., Durkin, K., amd Wiesley, M., 1959; Terrell, G., and Kennedy, W. A., 1957; Witryol, S. L., Tyrrell, D. J., and Lowden, L. M., 1965.) The evidence from these studies has been inconclusive and does not enable one to generalize as to the effectiveness of candy as a reinforcer, particularly on the learning of tasks involving size discrimination, concept formation, and other types of problem-solving. It was therefore of interest to examine the effectiveness of candy as a reinforcer within the conceptual framework of the present research on reinforcement. The dimensions of extrinsic--intrinsic and social--nonsocial lent themselves to a balanced design in which candy could be evaluated systematically. On the one hand, candy could be presented as an extrinsic reward when the subject receives a reward from an external source after making the correct response (i.e., pointing to the correct box). Under the intrinsic condition the candy could be hidden under one of three boxes and finding the candy could be made the task or problem to be solved. It was also possible to compare the effectiveness of candy as a reinforcer with social reinforcers and with nonsocial material (but inedible) reinforcers. These possible comparisons enabled us to construct a balanced design, which will be described in the procedure section. In order to keep the study simple and avoid overly complex interactions it was decided to limit the sample with regard to age, ethnic identity, and social class.

---

* The present study was carried out as an extension of the larger reinforcement study under the direction of Gerald Cimmet, a member of the Head Start Research team of the Developmental Research Laboratory.

Subjects. The subjects were ninety-six four-year-old lower-class black children from nine Get Set centers in Philadelphia. Enrollment in the Get Set program is limited to children from lower socioeconomic backgrounds. The names of all the four-year-old black children in the nine centers were recorded, and every child attending the program for at least one month was eligible for the sample.

Procedure. There were six different reinforcement conditions: extrinsic (social, nonsocial, candy) and intrinsic (social, nonsocial, candy). In each of the six conditions there were four experimenter categories (white male, white female, black male, and black female). Each experimenter category tested twenty-four children--two boys and two girls in each of the six reinforcement conditions. The distribution of subjects and reinforcement conditions was balanced across the available Get Set centers in order to avoid any systematic sample bias. The children were tested individually in their respective centers.

A problem-solving task similar to that employed by Beller, 1969, was developed specifically for this experiment. The task involved the child's learning that one box, regardless of position, was always correct. The three otherwise identical white rectangular boxes differed in a black geometrical design affixed to the top surface of each box. The designs were a square, a circle, and a triangle; the circle was the correct choice in all conditions.

At the start of the experimental task each child was given these instructions:

> Let's play a game. See these three boxes? I'm going to hide this die (appropriate edible substituted in the intrinsic candy condition) under one of these boxes and I want you to find it. There is a way you can always tell which box it is hidden under. I will always hide it under the correct box. Remember it is important that you find the box it is hidden under on your very first try.

After each trial, the boxes were rearranged behind a screen. The arrangement was a previously-determined standardized random order. After every fifth trial, each child was reminded that there was a way he could find the object on his very first try. Each trial continued until the child found the correct box. Correctness was immediately indicated by the appropriate reinforcement conditions. The total number of errors possible in any one trial was two. The child continued to a criterion score of six errorless trials or to the completion of thirty trials. Performance was measured in terms of errors per blocks of five trials or as total error over the thirty trials (less if criterion was reached).

In every reinforcement condition the children were told exactly how they were to know when they were correct. Reinforcement was always dispensed when the correct choice occurred regardless of the order of its occurrence, i.e., whether the child solved the problem on his first, second, or third response. These reinforced conditions should have maximized learning because the child had full information of the correctness of his choice.

In the candy reinforcement condition the children indicated a preference for either a raisin or a miniature chiclet. Such a choice situation was thought to optimize reinforcer value.

In addition to the general directions specified above, each child was given directions specific to the reinforcement condition he was to receive.

The intrinsic conditions involved the child's picking up the box in order to determine correctness. If the child's choice was incorrect the examiner said "Try another one." The differences in the intrinsic reinforcement conditions are outlined below.

(1) Intrinsic nonsocial. "I'm going to hide this die under one of these boxes. Remember to pick up the box that you think it is hidden under." Upon trial completion the examiner merely returned the screen to arrange for the next trial. There was no verbal or facial reinforcement.

(2) Intrinsic social. Same as above except that after the child had picked up the correct box, the examiner warmly reinforced him with smiles and such praises as "good," "just fine," " good boy (girl)."

(3) Intrinsic candy. The child was offered a raisin or a chiclet. His preference determined the material reinforcement for that task. "I'm going to hide this chiclet (raisin) under one of these boxes. Remember to pick up the box you think it is hidden under. When you find it you can have it to eat now or save for later." A plastic bag was offered and the child was encouraged to save his reward. If the child picked up the wrong box, the examiner said "Try another one" until the edible was found and removed. As in the nonsocial condition there was no verbal or facial reinforcement.

The extrinsic conditions involved the child's pointing to the correct box. He then received a signal to indicate correctness. In all extrinsic conditions the examiner said, "I'm going to hide this die under one of these boxes. I want you to point to the box you think it is hidden under. Remember, don't pick it up." Whenever the child pointed incorrectly, the examiner said "Try another one."

(1) Extrinsic nonsocial. A battery-powered foot pedal-operated light signal was used to indicate correctness. This was a nonsocial condition with no verbal or facial reinforcement. The mechanics of the light signal were carefully explained and demonstrated to the child in order to prevent distraction or increased attention due to the novel apparatus. The child was told, "When you point to the box the die is hidden under, the light will go on."

(2) Extrinsic social. When the child pointed to the correct box the examiner smiled and said "Very good," etc. The examiner--reinforcement was the same as in the intrinsic social condition.

(3) Extrinsic candy. After the child demonstrated preference for the chiclet or raisin, the experimenter told him, "When you point to the box the die is hidden under, I will give you the chiclet (raisin); you can eat it now or save it for later." As in the intrinsic candy condition, a plastic bag was offered, and the child was encouraged to save the reward. The edible was the only reinforcement dispensed; no verbal or facial enforcement was given.

Sex and ethnic identity of the experimenter were controlled. An equal number of black and white, male and female experimenters were assigned randomly to all experimental groups.

The basic design of the study was a 2 x 3 x 2 pictorial design in which the extrinsic--intrinsic dimension represented one factor, the social--nonsocial and categories a second factor, and male and female children a third factor.

Hypotheses. Superior performance with extrinsic reinforcement involves preference or reliance on external support or external sources for information. Superior performance with social reinforcement involves preference or reliance or interaction with people. Superior performance with material candy reinforcement involves preference or reliance on tangible rewards. As the locus of preference or reliance shifts from external and tangible to internal and symbolic rewards, performance becomes more a function of reinforcements intrinsically mediated resulting in greater independence from social and tangible reinforcers.

The characteristics of the children proposed for investigation in this study suggested expectations of superior performance under extrinsic reinforcement. Considering the developmental level, prior experience, and previous experimental evidence, it seemed unlikely that the children suggested for this study possessed the internal mediation necessary to render them independent of external sources of information and reinforcement. Intrinsic reinforcement conditions, because of the additional requirements on the subject's own interpretive processes, were predicted to be less effective than the corresponding extrinsic conditions. That is, in the extrinsic--intrinsic dimension when the three reinforcement conditions within each dimension were summed to reflect the overall performance on the problem-solving task was expected for the extrinsic conditions.

With the lower-class preschool children proposed for this experiment it was expected that the nonsocial (light) conditions would be less effective than the social and candy reinforcement conditions in influencing performance on a problem-solving task; however, no prediction was made with regard to the relative effectiveness of social and candy reinforcement. Therefore no substantive hypothesis, predicting expected outcome of the social, nonsocial and candy reinforcement variations was formulated.

Thus the major hypotheses tested in this study were (1) extrinsic reinforcement will be more effective than intrinsic reinforcement in facilitating learning of a problem-solving task; (2) although nonsocial reward was expected to be less effective than social and candy reward the design for the analysis of these data allowed for an overall test of significance of differences between all three categories rather than a simple dichotomy or hierarchal ordering.

The sex of the children was controlled by having an equal number of boys and girls in each reinforcement condition. Possible sex differences were to be investigated in the analysis; however, no substantive prediction was made.

Results. The major results of this analysis are summarized in Table 1. As in our larger reinforcement study the analysis yielded a significant ($p < .05$) main effect based on the total performance errors and the intrinsic and extrinsic dimensions. The mean number oftotal errors for the six reinforcement conditions is presented in Table 2. In each of the three categories (social, nonsocial, candy) there was less total error in the extrinsic dimension than in the intrinsic dimension.

The differences among the social, nonsocial, and candy categories were not significant. It was expected that the nonsocial conditions would be the least effective in influencing performance on the problem-solving task. Contrary to this expectation, the candy reinforcement category, not the nonsocial category, had the highest performance error of the three categories.

Table 2 shows that the candy category not only had the highest performance error when the intrinsic and extrinsic dimensions were combined, but it also had the highest error rate when the dimensions were considered separately. On the other hand, the social category had the least performance error when the combined intrinsic--extrinsic dimension was considered, but this was the result of the social--nonsocial difference and the extrinsic reinforcement condition. The social cate-

TABLE 1

ANALYSIS OF VARIANCE ON A PROBLEM SOLVING TASK DURING SIX SUCCESSIVE BLOCKS OF TRIALS WITH TWO MAJOR DIMENSIONS OF REINFORCEMENT (INTRINSIC AND EXTRINSIC), THREE CATEGORIES OF REINFORCEMENT WITHIN EACH DIMENSION (SOCIAL, NON-SOCIAL, MATERIAL), AND SEX OF CHILD

Source	df	MS	F
Between Subjects			
A (Intrinsic-Extrinsic)	1	100.84	5.61*
B (Social, Non-social, Material)	2	38.72	2.15
C (Sex)	1	4.52	<1
AB	2	25.55	1.42
AC	1	18.42	1.02
BC	2	.33	<1
ABC	2	13.05	<1
P(ABC) (error between)	84	17.98	
Within Subjects			
D (Blocks of trials)	5	50.15	16.47**
AD	5	6.49	2.13
BD	10	5.02	1.68
CD	5	3.84	1.26
ABD	10	4.01	1.32
ACD	5	3.20	1.05
BCD	10	3.78	1.24
ABCD	10	3.15	1.04
PD(ABC) (error within)	420	3.04	

*p<.05

*p<.01

TABLE 2

MEAN NUMBER OF TOTAL ERRORS MADE OVER THE SOCIAL, NON-SOCIAL AND MATERIAL CATEGORIES

	Social	Non-social	Material
Intrinsic and Extrinsic	20.22	23.84	25.72
Intrinsic	25.06	24.94	27.13
Extrinsic	15.38	22.75	24.31

gory did not retain the status of lowest performance error when both dimensions were considered separately. The intrinsic social condition actually had a higher mean total error score than the intrinsic nonsocial condition. This finding failed to support the expected outcome of highest error, or poorer performance under conditions of nonsocial reinforcement, regardless of the specific intrinsic--extrinsic dimension. It was the very low error rate in the extrinsic social condition which accounted for the lower error rate in the combined social category.

The highly significant difference among the blocks of trials (see Table 1) indicates that, over all conditions, there were fewer performance errors as the task progressed. The mean number of errors across the thirty trials for the combined intrinsic--extrinsic dimension are presented in the upper section of Table 3, and illustrated in Figure 1.

In addition to this apparent learning effect across the blocks of trials there was an intermediate effect between dimension (extrinsic--intrinsic) and blocks of trials. This dimension interaction (AD) approached significance ($p < .10$) (see Table 1). The interaction between the intrinsic--extrinsic dimension and blocks of trials attests to the lower error rate of the extrinsic dimension across the blocks of trials. The mean number of errors per blocks of trials for the intrinsic and extrinsic dimensions as well as the resulting six reinforcement conditions are presented in the middle section of Table 3. Figure 2 illustrates the differential error rate across the blocks of trials for the intrinsic and extrinsic dimensions. Examination of the middle section of Table 3 reveals the strong contribution of the extrinsic social condition to this successfully lower error rate.

TABLE 3

MEAN NUMBER OF ERRORS PER BLOCKS OF FIVE TRIALS

	Trials					
	1-5	6-10	11-15	16-20	21-25	26-30
Intrinsic and Extrinsic	5.08	4.20	3.97	3.71	3.34	3.02
INTRINSIC	5.06	4.70	4.38	4.21	3.69	3.71
Social	5.12	4.62	4.38	4.75	2.94	3.56
Non-social	4.94	4.50	4.44	3.75	3.44	3.88
Material	5.06	5.00	4.31	4.13	4.69	3.94
EXTRINSIC	5.10	3.69	3.56	3.21	3.00	2.25
Social	5.44	3.00	2.12	1.94	1.94	.94
Non-social	4.88	3.69	4.19	4.06	3.31	2.62
Material	5.00	4.38	4.38	3.62	3.75	3.19
SOCIAL	5.31	3.81	3.25	3.34	2.44	2.25
NON-SOCIAL	4.91	4.09	4.31	3.91	3.38	3.25
MATERIAL	5.03	4.69	4.34	3.88	4.22	3.56

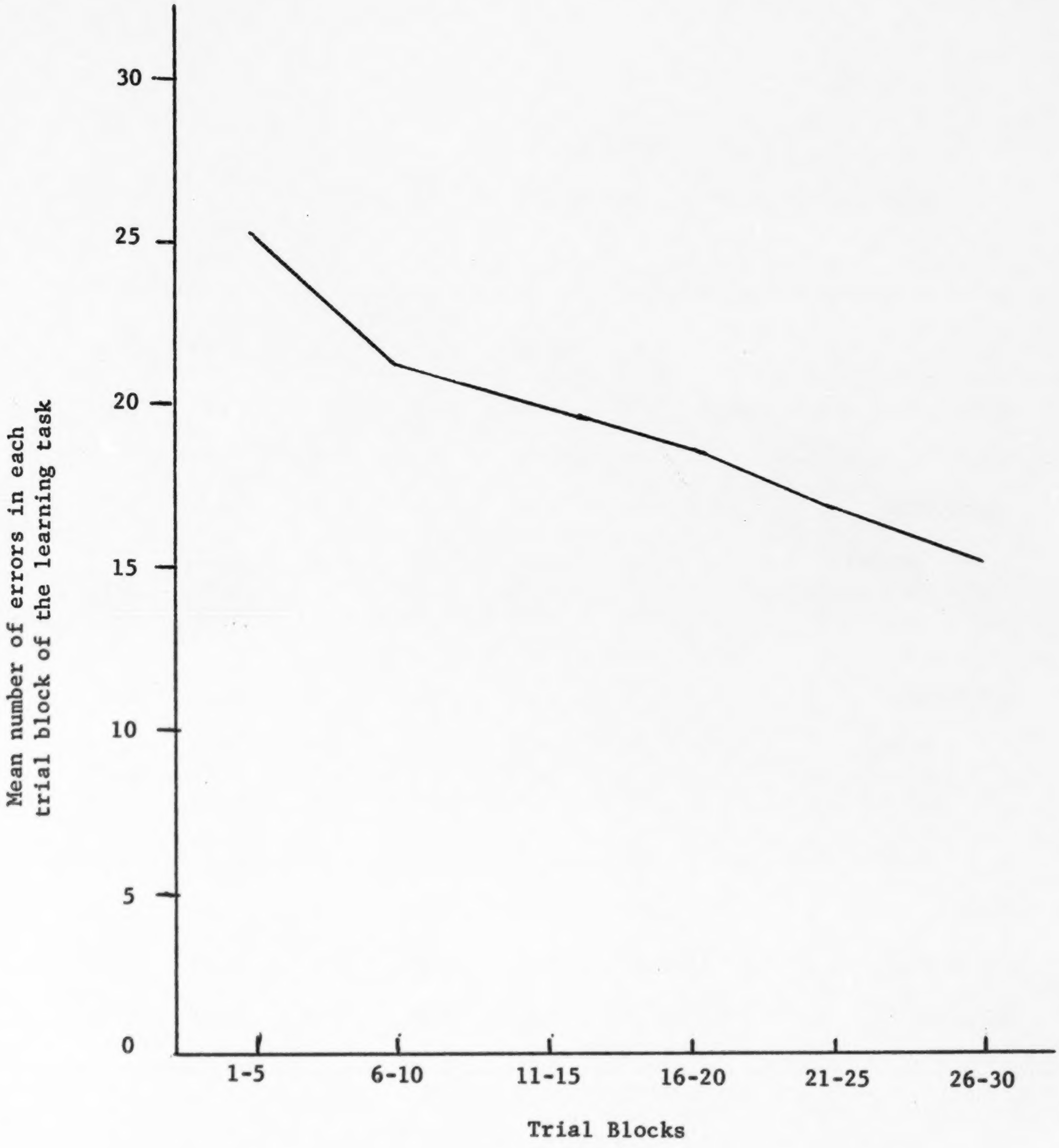


Figure 1. Mean number of errors per block of five trials across all conditions

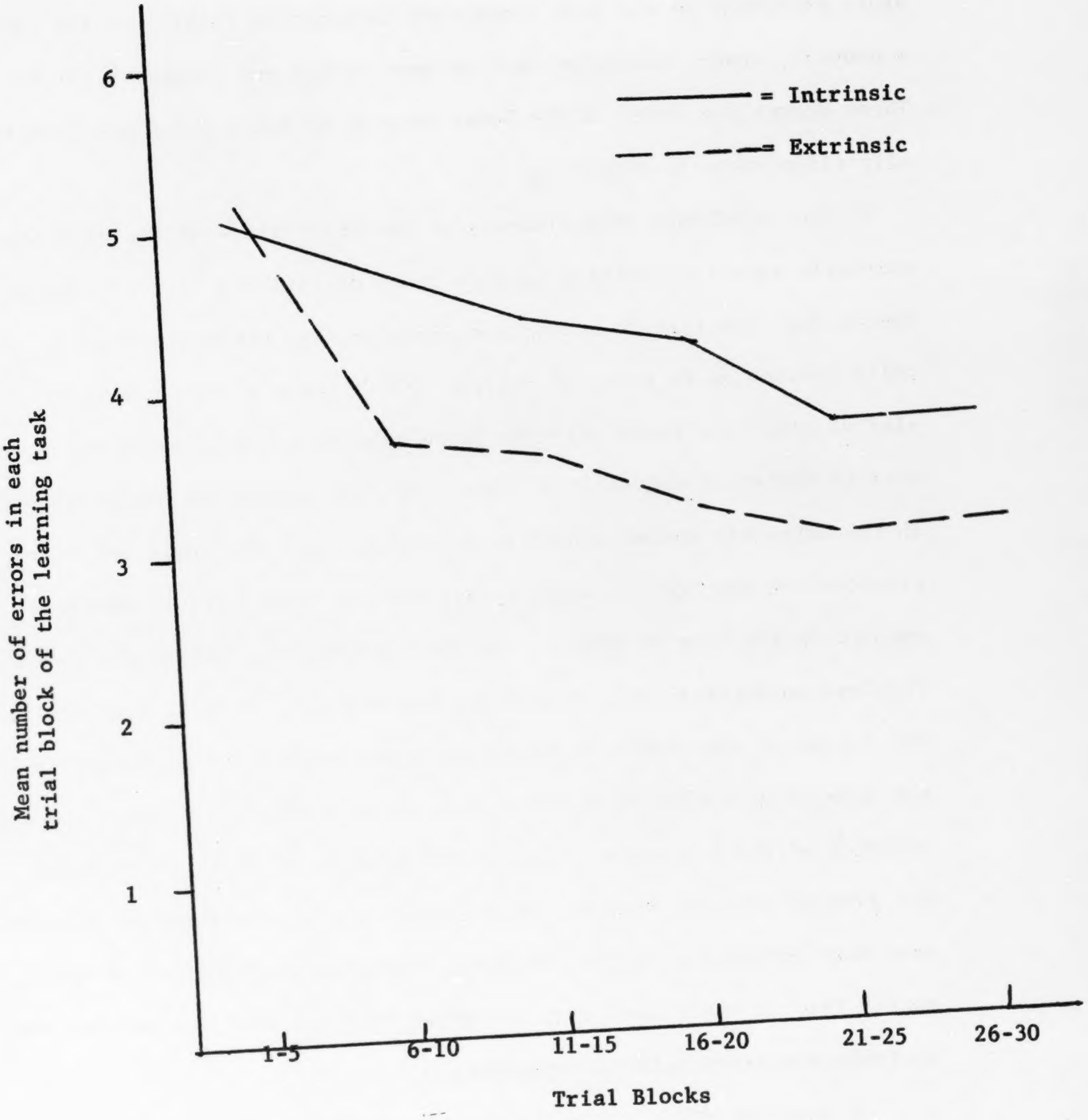


Figure 2. Mean number of errors per block of five trials for intrinsic and extrinsic reinforcement dimensions

This powerful contribution of the extrinsic social condition is again evidenced in the less pronounced interaction ($p < 10$) of the social, nonsocial, candy categories and the mean errors per blocks of trials. These scores are found in the lower protion of Table 3 and are graphically illustrated in Figure 3.

The inordinate effectiveness of the extrinsic--particularly the extrinsic social--condition in this group of children is particularly important. Contrary to a common stereotype that the lower-class deprived child growing up in urban slum areas has to learn early to care for himslef we find that these children learn best in a situation in which support is maximized and fail to learn when such support is not forthcoming. In the extrinsic social condition ofreinforcement the adult not only provides the cue for the correct response but also provides emotional support in the form of praise. In the intrinsic conditions the child receives no external help in solving the problem. Thus if a child in the jungle of the ghetto is forced to manage on his own it is not in the area of cognitive development that he succeeds on his own. The importance of the reassuring relationship with an adult is evidenced by the greater effectiveness of the extrinsic social condition of reinforcement when compared with the extrinsic nonsocial condition of reinforcement. Thus it would seem that the young deprived child is neither cognitively nor emotionally independent.

A question which arises is why the condition of social reinforcement is relatively ineffective when it accompanies intrinsic reinforcement. Apparently such a combination makes the learning situation too complex for these young children. Finding the right box, lifting it,

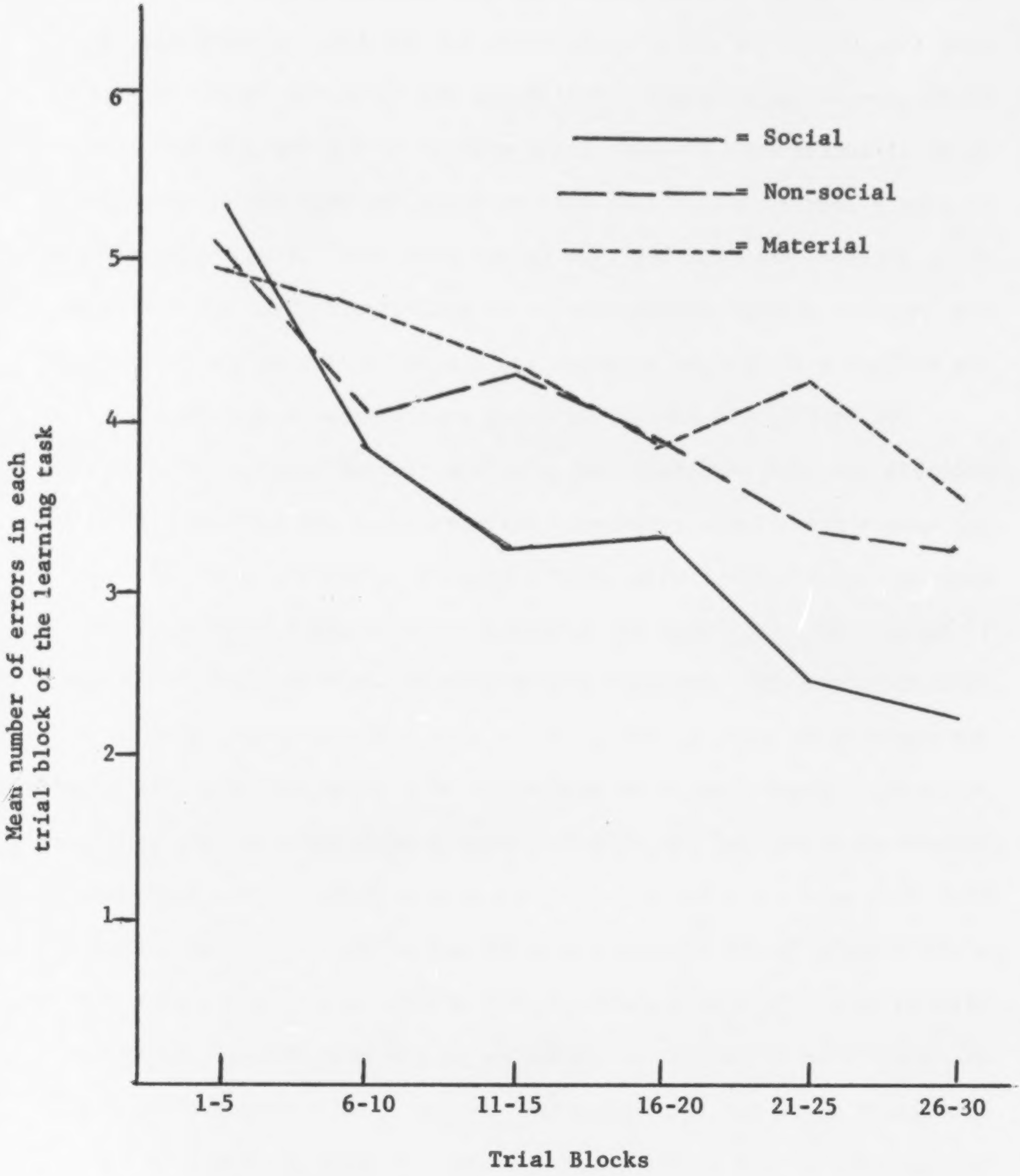


Figure 3. Mean number of errors per block of five trials for social, non-social, and material reinforcement categories

looking at the discovered object and then hearing approval is more complex than simply pointing at the right box and hearing approval. A study carried out by Adler (1961) found the intrinsic social condition to be effective with somewhat older middle-class white children. It is likely that a similar task used by Adler was less overwhelming to these children than our task was to our children. At any rate this issue could be settled experimentally by manipulating the familiarity of the subject with a class of tasks and the difficulty of the task itself.

The ineffectiveness of the candy condition as a reinforcer is probably the most striking finding of the present study. While we did not have a directional hypothesis with regard to the relative effectiveness of candy versus social reinforcement we certainly espected candy to be more effective than the nonsocial reinforcement condition. At this point the most plausible interpretation would be the same as the one advanced by Spence (1967), namely that the candy functioned as a distracter rather than as an emphasizer or a drive reducer. The experimenters reported that the children reacted positively to the candy and that they were not overwhelmed by its attractiveness. The fact that a child could choose between a chiclet and a raisin enhanced the positive value of the edible chosen by the child. But it also meant for the child that he had to pay attention to too many things. Candy was not merely a cue for the correctness of the child's response reducing the tension created by the cognitive task but also an object to put into one's mouth, to chew or eat and enjoy in its own right. The conclusion would therefore be that candy or other edibles may have greater value for extremely simple tasks or tasks in which distraction rather than concentration play an essential part in the solution of the problem at hand.

REFERENCES

Adler, P. The relationship of two types of dependency to the effectiveness of approval as a reinforcer (among a group of emotionally disturbed children). Unpublished doctoral dissertation, New York University, 1961.

Beller, E. K. Motivation, Locus of Reinforcement and Problem-Solving in Children. Presented to annual meeting of the American Psychological Association in San Francisco, California, September, 1968.

Beller, E. K. A Developmental Study of the Effects of Different Types of Reinforcement on Problem-Solving in Children. 1969 (study in progress).

Spence, J. T. and Segner, L. L. Verbal versus nonverbal reinforcement combinations in the discrimination learning of middle- and lower-class children. *Child Development*, 1966. *37*, 269-281.

Terrell, G., Durkin, K. and Wiesley, M. Social class and the nature of the incentive in discrimination learning. *Journal of Abnormal and Social Psychology*, 1959, *59*, 270-272.

Terrell, G. and Kennedy, W. A. Discrimination learning and transposition in children as a function of the nature of the reward. *Journal of Experimental Psychology*, 1957, *53*, 257-260.

Witryol, S. L., Tyrell, D. J. and Lowden, L. M. Development of incentive values in childhood. *Generic Psychology Monographs*, 1965, *72*, 201-246.

STUDY V

The Teacher--Child Interaction and the Impact of Head Start Programs on Cognitive Development in Disadvantaged Preschool Children: Part II

The first part of this study was included in last year's Annual Report. Briefly, the study investigated, through intensive observations, how children who had demonstrated a gain in intellectual achievement in Head Start developed different relationships with their teachers than children who had failed to demonstrate such a gain. This study found that gainers made more instrumental dependence requests and fewer emotional dependence requests of the teachers, received more positive reactions from teachers, coped more effectively with unsatisfactory reactions from the teacher. Gainers were also found to evoke more attention from the social environment when they engaged in autonomous activities, and finally, that gainers were more able than other children to make the learning process a self-rewarding one.

Since all the children in our observational study were part of a national sample, we decided to relate data gathered on these children by the national study to our own data in the direct observational study. We felt that the soundness of our own work would gain considerably if relationships between our own data collected in an intensive study on a small sample of children would relate in a meaningful way to the data collected less intensively in the national study but of a much larger sample of children. The particular measures taken from the national study will not be described in detail here. For detailed information on each of these measures, the reader is referred to a report by the Institute for Educational Development.

The findings of this analysis are all based on Mann-Whitney *U* tests or on "t" tests. Unless otherwise indicated, all findings reported met the criterion of $p \leq .05$.

Children from crowded homes made fewer realistic demands for help from the teacher ($p<.10$) and were less effective in evoking a reaction from the teacher to their demands ($p<.10$). These children from more crowded homes also made less constructive use of the help they received from the teacher in response to their requests. When engaged in their own activity, the same group of children were less distracted by other children. This first cluster of findings strongly suggests that the child from a lower-class crowded home has a less intensive relationship with the teacher in the Get Set program. The particular aspects of this relationship which are weaker would appear to lower the readiness of a child from a crowded home to gain from his educational experiences in the Get Set program.

A factor analysis of the behavior inventory employed in the national study yielded several factors. We investigated the relationship of these factors to our own data. We found that children who were high on a factor of impulsivity, excitability and defiance were less effective in getting the teacher's attention. The same children had greater difficulty continuing their ongoing activity when another child or adult entered their field of action. This finding suggests a vicious cycle. The impulsive, excitable and defiant child has difficulty in relating to others. However, the adult is less responsive to this child, even when the child makes an attempt to enter into a relationship with his teacher. Thus the very difficulty becomes self-perpetuating.

Children who are rated high on inhibition, withdrawal and mistrust of others on the behavior inventory exhibited fewer positive attention-getting responses toward teachers than other children. This finding may be considered an independent validation of the behavior inventory by our method of direct observation.

The national study made available to us data concerning the behavior of teachers through the Observers Rating Form. We were particularly interested in relating the characteristics of the teachers of our children as measured by the observational technique in the national study to the success of our own children in learning a cognitive task under conditions of Task Intrinsic Reinforcement. We found that the children of teachers who used better and more diversified techniques of teaching and children of teachers who cultivated more respect for the rights, possessions and idiosyncracies of others, learned our problem-solving task better under conditions of intrinsic reinforcement than children from other teachers. A similar trend was found for children of teachers who exhibited greater respect than other teachers for the child's family ($p < .10$). Interestingly, the same characteristic of teachers, that is, showing respect for the child's family, was very significantly associated with a child's readiness to gain from the educational experience in the classroom. In other words, more of our children who showed a positive gain in their intellectual performance came from teachers who manifested more respect for the child's family. Here may be an important link between the classroom and the family which deserves a good deal of attention in continued efforts of educational programs for lower-class, disadvantaged children.

STUDY VI

THE EFFECTS OF DIFFERENT LEARNING ENVIRONMENTS ON CREATIVITY IN CHILDREN

Not too long ago, creativity was considered a gift which would show itself, if the favored individual were left to his own devices. The same people who held this view also maintained that analytic studies of creativity would be impossible without destroying the essence of the creative act itself. Guilford's well-known A.P.A. Presidential address in 1950 marked the beginning, at least among psychologists in the United States, of a quite different trend. Creativity began to be viewed as a process available to all, one which could be hampered or enhanced according to the climate in which the possibility for its expression occurred.

It has been only recently that reported research findings relevant to this position have begun to appear in the literature. One of the earlier studies reported was that of Reichenberg-Hackett (1962), who used observational techniques in nursery settings and who found that imagination was stifled when routines were carried into free play, and that the imaginative products of children increased when the teachers encouraged questions and alternative answers. Wallach and Kogan (1965) conclude from the extensive research that emphasis on success and failure in the normal testing situation will reduce differentiation within the thinking domain while permissiveness fosters differentiaion and raises levels of creativity. Wodke and Wallin (1965) offered more direct evidence with their finding that children of low-controlling teachers showed higher gain in creativity (TTCA) than children of high-controlling teachers. In the same vein, Nakamura and MacKinnon, each in separate

---

Presented at the biennial meetings of the Society for Research in Child Development, Santa Monica, California, March, 1969.

studies, report that conformity tendencies and conformity pressure reduce creativity in problem-solving, in tolerance for assymetry and in other ways. All these studies support the notion that on a continuum of learning and/or performance/environments ranging form autocratic-closed to democratic-open, the democratic environments tend to foster creativity more than autocratic environments. Although there are a few trends of the research which we have reviewed briefly here which are clear, a number of unresolved questions and issues remain. Because of time limitations, we shall limit ourselves to the discussions of two of these issues which have particular relevance to our own study; first, effects of continuity and consistency of the child's environment on creativity, and secondly, the complex interacting effect of environment and developmental change on creativity.

With regard to the first issue, the evidence from two studies strongly suggests that consistency and continuity of environment may have a facilitative effect on creativity. Tisdall (1962) compared retarded children who received consistent individual attention and an individualized curriculum over a period of two years with control children who had a variety of teachers during the same time. The experimental children were found to be superior on verbal but not on non-verbal tests of creativity.

Another study on this issue was carried out by Weber (1967) who compared fourth grade children with consistent and inconsistent, direct-indirect (autocratic-democratic) classroom experiences. One group had an indirect (democratic-open) teacher for the first four grades, a second group had a direct (autocratic-closed) teacher for the first four grades, the third and fourth groups had one type of teacher for the first three grades and the opposite type for the fourth grade. Weber found that consistent patterns of teaching fostered total creative potential as measured by the TTCA. However, each of the two types, that is, autocratic (direct) and democratic (indirect) of teaching enhanced different components of creativity in puzzling ways. (An important if unstable finding in Weber's study - and we believe in most of the studies we have reviewed - was that inconsistency of classroom environment had no facilitative effect on any aspect of creativity (TTCA)). These two studies, therefore, suggest that consistency of experience is an important factor relevant to creativity, although the specific interactions between consistency and content of experience await clarification from further research.

A similar conclusion can be drawn from a review of studies dealing with the interesting effect of environment and developmental change on creativity. For example, in a study investigating effects of specific training on productivity of ideas, Torrance found that training was effective with older (2nd and 3rd grade) and not with younger (1st grade) children. Wodke and Wallin found that controlling teachers affected different components of creativity in fourth graders than in fifth graders. Torrance (1962), who has summarized the literature on developmental changes in creativity, associates these changes with factors in the child's environment. He observes a sharp decrease in creativity from third to fourth graders and ascribes this change to an increase of conformity pressures from peers which produces an increased dependency on consensual validation and a decrease in the freedom and enthusiasm with which a child communicates original ideas. Wallach and Kogan (1965) ascribe this decrease to an increase in the evaluative dimension in the classroom. These relationships between enviornment and age in their effect on creativity point to the importance of development and to the need for further research to clarify the roll of development in environmental effects on creativity.

The study to be presented was undertaken against the background of these issues.

Problem

The present study investigated effects of different teaching styles on creative behavior. Two teaching styles, namely Democratic-Open-ended (Style A) and Autocratic-Closed (Style B) were measured in the classroom and reproduced experimentally. The following hypotheses were tested: L. Children from Style A classrooms exposed to Style A experimental treatments will manifest highest gains on creativity scores. 2. Consistency between experiences in the classroom and in the experimental environment will have a more beneficial effect on creativity than inconsistency between the two environments. 3. The predicted relationship in Hypothesis 1 will be greater for older than younger children.

Subjects

Sixty-four children were selected from two second and two fourth grade classrooms. The children were homogeneous with regard to IQ - Lorge-Thorndike M = 124 - and SES (Middle class).

Procedure

A. Teaching Styles or Classroom environments - Nine teachers were rated on scales developed by the second author. One extreme, namely Democratic-Open-ended (Style A) was defined as follows: Teacher allows children a wide range of chioces, encourages exploration, makes little distinction between work and play, uses flexible curriculum, is child oriented and uses praise as major method of reinforcement. The other extreme, namely Autocratic-Closed (Style B) was defined as follows: Teacher issues orders, expresses disapproval frequently, is detached, group oriented, emphasizes distinction between work and play, gives learning experiences consisting of provision of facts, follows a strict curriculum, controls use of materials and use of classroom space.

The second and fourth grade teachers were rated independently by two raters. Those two teachers at each grade level who most nearly approached the opposing extremes of the scales were selected.

Subjects were assigned randomly to experimental groups on the basis of sex. Each group had four boys and four girls.

Each experimental group was taken, in turn, from the classroom to a separate area. The experimental treatment extended for one hour, four times a week on Monday, Tuesday, Thursday and Friday. During that hour, the experimenter acted out different roles, depending on teaching styles A and B.

A-C - (designed to meet criteria on that pole of the BTRS). A story was introduced as being very interesting, one to which the children should pay close attention so as not to miss any of the details. Seats were arranged in rows and assigned to children by the Experimenter for the duration of the experiment. E remained behind the desk in the front of the room as much as possible. The story was selected by E and read to the children. They were then asked four or five questions which could be easily answered by facts contained in the story. E responded to answers by nodding and saying "Un-huh". Questions were not encouraged and if asked were answered briefly by factual reference to the story material. Pencils and paper were distributed and Ss were asked to copy a drawing of the main character of the story from a sample shown by E. E attempted to create a positive climate while remaining aloof.

D-O (experimental experience was as follows:) E introduced the story as interesting and fun. The children were asked to bring chairs and to gather around the E in the front of the room. E read a story selected from those available by group concensus. E paused at intervals, four to five times in the reading to ask the group for ideas as to "what they think will happen next in the story." Comments during and following the story were consistently encouraged. Pencils and paper were distributed and Ss were asked to draw someone or something from the story which they liked or which interested them. E behaved in a warm manner towards the children and attempted to create a positive climate.

Neither experimental condition is intended to be a teaching situation since, following the purpose of the experiment, E sought to recreate the total climate of the existing learning environments rather than to provide training for any specific entity of the creative process.

The four subtests of the figural part of TTCT was administered in groups to all children before and after the experiment.

Creativity: A process of becoming sensitive to gaps in knowledge, missing elements, disharmonies and so on; identifying the difficulty; searching for solutions, making guesses; testing and retesting these guesses and finally, communicating the results: The emphasis is on divergent thinking (Torrance, 1962).

Fluency: Ability to produce a large number of ideas.

Flexibility: The ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies.

Originality: The ability to produce ideas that are away from the obvious, commonplace, banal, or established.

B. Stories selected as appropriate for the task and for each grade level by librarians having familiarity with the population of children from which the sample was drawn were chosen for use in the experimental situation.

They were: Grade 2 - The Fat Baron, The Magic Finger, The Mystery of the Woods, and one Homer Price story. Grade 4 - The Magic Finger, The Puma and the Panther, The Matchlock Gun, and one Homer Price story.

A pencil drawing pertaining to the stories was drawn by each subject, either following a sample shown by E or one of their own design.

Following completion of the experiment, and after E had left, teachers asked the children for their general impressions of, and attitudes toward, both E and the experimental situation. Specifically, each group was asked separately: "Did you like Mrs. M's stories? Did you think Mrs. M was nice? Why? Did you have to do what she said and did you get a chance to say what you wanted to?" The teacher recorded group concensus as expressed by the children as a subjective evaluation of the effectiveness of the assumed differences in each treatment as enacted by E.

On Friday of the week in which the experimental treatment was completed, the TTCT (Torrance Test of Creative Talent) - alternate form - was administered as before.

Pupil's reactions to E were collected. The questionnaire indicated that the children had perceived E and the treatments as intended, since all children seemed to like the stories, thought that E was nice, and responded in the expected direction on question 4, that is, that for the D-O condition; they had a chance to do what they wanted to, and for the A-C condition, they had to do what they were told to.

Results and Discussion

Only data from the Figural tests of the TTCT will be presented.

An analysis of variance was carried out to determine whether initial differences existed between our four groups on Figural creativity scores. No significant differences emerged from this analysis.

4

Since our study was primarily interested in the interaction of all three factors, that is, grade level, background experience of classroom climate and experimentally produced experience of classroom climate, we shall limit ourselves today to those findings which pertain to the major issues of environmental consistency versus inconsistency, environmental content (i.e., teaching style) and the grade level of the child. Our findings did not confirm our first hypothesis, which predicted that a consistent democratic-open environment, that is in both the child's classroom background and the experimentally produced classroom, will have the most beneficial effect on creativity regardless of the child's age. In other words, we did not find an interacting effect of consistency and content of environment when age was held constant. Our data did support our second hypothesis which predicted a differential effect of environmental consistency when environmental content and the child's age were held constant. As can be seen in Figure 1, consistency of environment produced greater increases of Figural Originality when compared with effects of inconsistency of environments. Moreover, it would seem (Figure 2) that children coming from democratic-open classrooms and being exposed to autocratic-closed experimental teaching not only failed to gain but actually got worse on Figural Originality.

Our data also gave some support to our third hypothesis which was a qualification of hypothesis one and which predicted that older children will give more evidence than younger children of a greater benefit from a consistent - democratic-open environment. The triple action of environmental consistency, content and developmental change can be seen in Figure 2. Older children benefited most from a consistent democratic-open ended environment by showing an increase on figural flexibility scores, whereas the younger children suffered most from a consistent autocratic-closed environment by showing a corresponding decrease on their Figural Flexibility scores. In other words, development is a critical factor in the effects on creativity of the type of teaching and the consistency with which such teaching is carried out.

In conclusion, the present study has attempted to obtain more evidence and thereby clarify the role of consistency and development in the effects of teaching patterns on creativity. Our findings show clearly that both the child's age and the consistency with which he experiences certain types of teaching affect the creative aspect of his performance. Consistency of experience, which has implications for emotional security by reducing uncertainty in the environment, seems to encourage originality which taps a person's ability to move away from conformity and from well-established ways of dealing with problems. If the teaching experience is consistently democratic-open, it enables the older child to become more flexible; that is, to become more open to using a variety of ideas and strategies in coping with problems. The same relationship applies to the younger children, but here the weight is tipped toward the opposite end of the democratic-autocratic continuum. In other words, the younger child rends to become discouraged from being flexible or open to using a variety of ideas and strategies in coping with problems after he has been exposed consistently to an autocratic-closed environment. Thus, consistency and development affect the relationships between the learning situation and creativity in a psychologically meaningful way.

Consistency of experience appears to affect creativity because of its emotional implication. Once the consistency of the experience is assured, its quality, that is, whether the method of teaching is open or closed, will affect a child's ability to be flexible or open in using a variety of ideas or strategies in coping with problems.

THE EFFECTS OF AUTOCRATIC-CLOSED VERSUS DEMOCRATIC-OPEN LEARNING ENVIRONMENTS ON CHILDREN'S CREATIVE THINKING

Temple University

Paula Malone
E. Kuno Beller

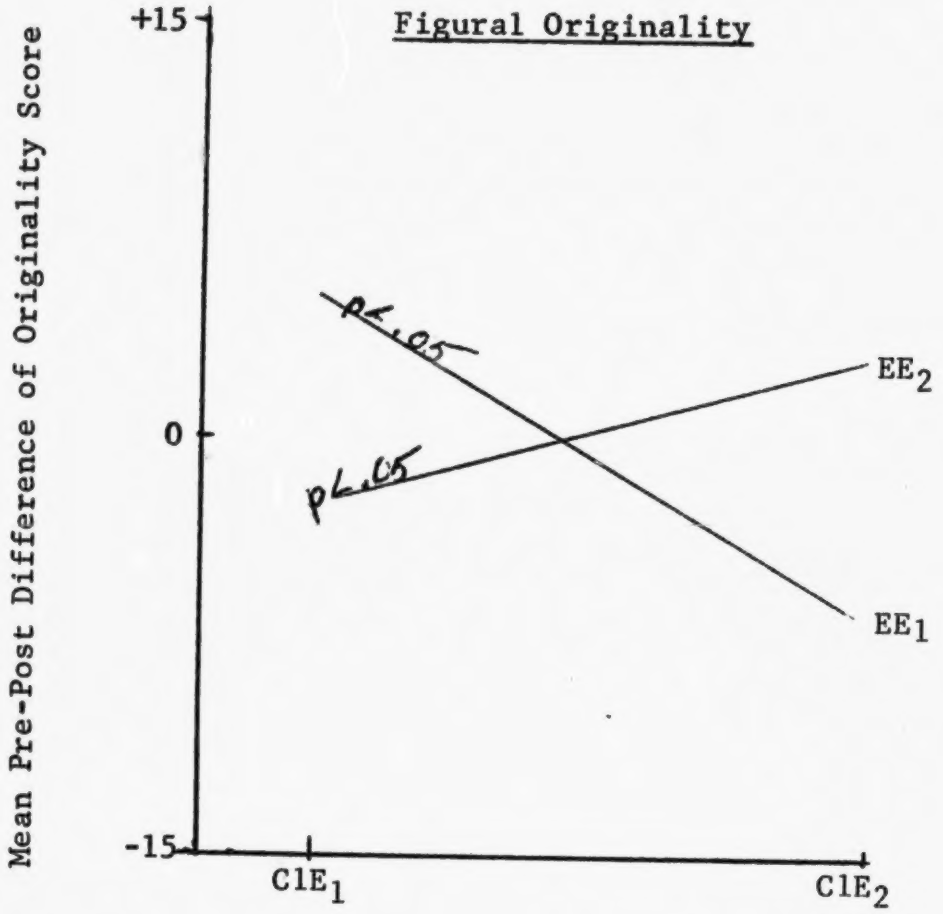


Figure 1. Interaction of Classroom Environment (ClE) by Experimental Environment (EE).

E_1 = Autocratic-Closed

E_2 = Democratic-Open

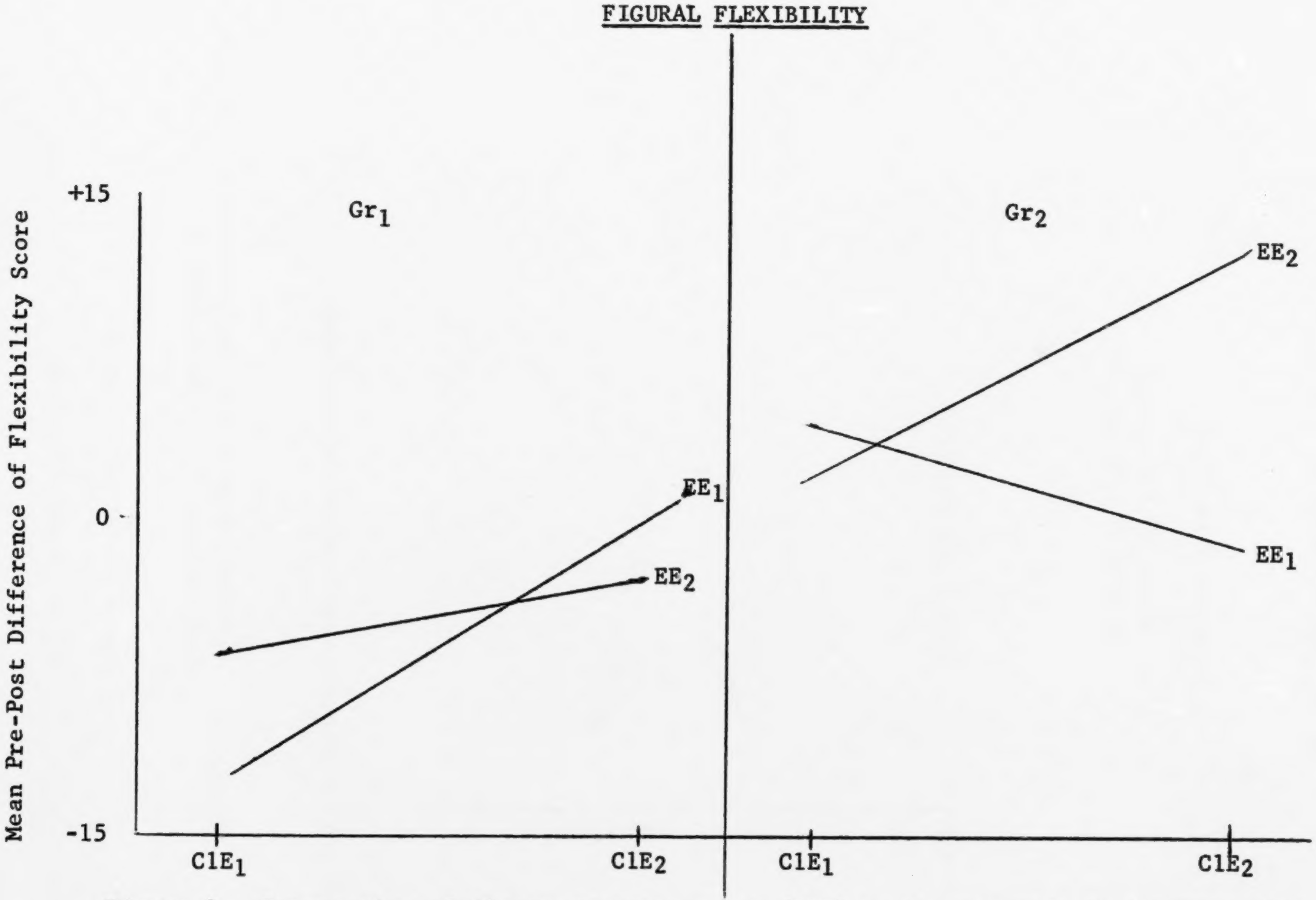


Figure 2. Interaction of Classroom Environment (ClE) by Experimental Environment (EE) by Grade (Gr).

E_1 = Autocratic-Closed
E_2 = Democratic-Open

Gr_1 = 2nd Grade
Gr_2 = 4th Grade

REFERENCES

1. MacKinnon, Donald W. "Characteristics of the Creative Personality Implications for the Teacher-Learning Process," in G.K. Smith (ed.), Current Issues in Higher Education, Washington, D.C., Association for Higher Education, 1961.

2. Nakamura, Charles Y. "Conformity and Problem-Solving." Journal of Abnormal and Social Psychology, 1958, 56, 315-329.

3. Reichenberg-Hackett, Wally. "Practices, Attitudes and Values in Nursery Group Education." Child Development, 1962, 10, 151-172.

4. Tisdall, William J. "Predictive Thinking in Retarded Children." Exceptional Child, 1962, Vol. 29, 36-41.

5. Torrance, E. Paul. Guiding Creative Talent. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.

6. Torrance Tests of Creative Thinking Norms - Technical Manual, Research Edition. Princeton, New Jersey: Personnel Press, 1966.

7. Wallach, Michael A. and Kogan, Nathan, Modes of Thinking in Young Children. New York: Holt, Rinehart and Winston, Inc., 1965.

8. Weber, Will A. "Teacher Behavior and Creativity." Unpublished Doctoral Dissertation. Temple University, 1967.

9. Wodke, Kenneth H. and Wallen, Norman E. "The Effects of Teacher Control in the Classroom on Pupils' Creativity-Test Gains." American Educational Research Journal, 1965, Vol. 2, No. 2, 75-82.

TEACHER RATINGS

Control of Children

Please rate the extent to which the teacher controls the class by issuing orders and commands. Is a suggestion mandatory or optional?

1._________The teacher issues peremptory orders.

2._________

3._________The teacher's orders and suggestions are not completely coercive.

4._________

5._________The teacher is coercive in some matters, but optional suggestions are also used.

6._________

7._________The teacher tends to avoid coercion wherever possible.

8._________

9._________The teacher consistently allows the children a very wide range of free choice.

BELLER SCALES

TEACHER RATINGS

Distinction between Work and Play

Please rate the extent to which the teacher distinguishes between work and play.

1._________Distinguishes always.

2._________

3._________Distinguishes often.

4._________

5._________Permits some overlap.

6._________

7._________Permits much overlap.

8._________

9._________Makes very little distinction.

BELLER SCALES

TEACHER RATINGS

Approval-Disapproval

Please rate the direction of the teacher's critical reaction to the behavior of the children. Is the teacher's reaction generally one of praise and approval, or does the teacher usually blame and dissapprove?

1.________Praise and commendation given grequently and liberally

2.________

3.________Emphasis on approval. Disapproval is mild and infrequent.

4.________

5.________Approval and disapproval are balanced.

5.________

7.________Emphasis on disapproval. Approval is mild and infrequent.

8.________

9.________Continuous disapproval and fault-finding.

BELLER SCALES

TEACHER RATINGS

Closeness to Children

Please rate the extent to which the teacher seems to be really close to an in touch with the children.

1.________The teacher is very detached.

2.________

3.________The teacher is somewhat aloof.

4.________

5.________The teacher interacts easily with the children.

6.________

7.________The teacher is somewhat involved in the emotion and feelings of the children.

8.________

9.________The teacher is very sensitive and responsive to the feelings and needs of the children.

BELLER SCALES

TEACHER RATINGS

Enjoyment of teaching

Please rate the general attitude expressed by the teacher regarding her teaching experience.

1._________Fully enjoys each day's activities and discusses work with enthusiasm and involvement.

2._________

3._________Enjoys teaching most of the time and generally manifests interest in work.

4._________

5._________Has mixed feelings and fluctuates in attitude about teaching.

6._________

7._________Sometimes expresses dissatisfaction regarding teaching.

8._________

9._________Expresses discontent with teaching and performs duties in perfunctory manner.

BELLER SCALES

TEACHER RATINGS

Individual vs. Group Needs

Please rate the extent to which the teacher seems to be concerned with and attentive to the needs of individual children or the class as a while. Does the teacher direct her efforts toward the group as a group rather than allowing children to be "special" or "different"? Or does she become deeply involved with a particular child or a few children rather than with the group as a whole?

Please do not rate the teacher on how well she attends to individual or group needs, but only the direction of her concern.

1._________Group needs dominant.

2._________

3._________Group needs are more prominent than individual needs.

4._________

5._________Varies between group needs and individual needs.

6._________

7._________Individual needs are more prominent than group needs.

8._________

9._________Individual needs dominant.

BELLER SCALES

TEACHER RATINGS

Flexibility in Programming

Please rate the extent to which the teacher's activities are tied to an organized schedule. Is the class routine so rigidly scheduled that the reactions of children are disregarded when they do not fit the teacher's program or does the teacher seem to adapt her curriculum to the child's need and situational context.

1._________The teacher always follows a schedule or planned program.

2._________

3._________The teacher tends to follow a planned program but deviates occasionally, allowing changes because of unforeseen events.

4._________

5._________The teacher follows an organized schedule some of the day, but at other times of the day she improvises programs in response to situational demands.

6._________

7._________The teacher sometimes follows a loosely organized schedule, but most of the time she provides the materials, letting the children direct their activities.

8._________

9._________The teacher does not seem to impose any specifically planned program, but functions essentially as a catalyst and facilitator, channelizing interests and activities of individual children or subgroups of children.

BELLER SCALES

TEACHER RATINGS

Approach to Learning

Please rate the extent to which the teacher gives the pupils learning experiences which are assortments of facts, exercises or practice by repetition. For example, does the teacher stimulate the children to wonder or does she present a lesson or demonstration expecting the children to learn by practice and imitation?

Please do not rate the teacher on how successfully she either supplies facts or stimulates thinking. Consider only the extent to which she seems to be trying to do one or the other.

1.________The teacher provides demonstrations, facts and information.

2.________

3.________The teacher emphasizes mainly the acquisition of skills and information, but occasionally provides opportunity for spontaneous inquiry and expression.

4.________

5.________The teacher does some of both; giving information, teaching skills and inquiry and independent thought.

6.________

7.________The teacher emphasizes mainly stimulation of independent inquiry and expression, and only occasionally provides information and skill practice to her children.

8.________

9.________The teacher encourages the children to think and explore. She provides facts and skill training only when requested by the child or as a part of the child-initiated activities.

BELLER SCALES

TEACHER RATINGS

Classroom Arrangement

Please rate the teacher to the extent to which she arranged the place, i.e., physical location and movement of children in the group.

1._________Children's place in the group arranged and assigned by teacher: almost all of the time.

2._________

3._________Children's place in the group arranged and assigned by teacher: much of the time.

4._________

5._________Children's place in the group arranged and assigned by teacher: from time to time.

6._________

7._________Children have considerable freedom in choosing their own physical location and movement in the group.

8._________

9._________Children have much freedom in choosing their place. The teacher functions primarily as a facilitator of a child's choice.

BELLER SCALES

TEACHER RATINGS

Control of Materials

Please rate the extent to whcih the teacher controls instructional materials.

1._________Teacher clearly and firmly directs the use of materials.

2._________

3._________Teacher directs use of materials most of the time.

4._________

5._________Teacher and children fluctuate in determining choice and use of materials.

6._________

7._________Children select materials to be used most of the time. Teacher remains in the background or facilitates.

8._________

9._________Children are dominant, may select and use materials at will.

Study VII

Continuities of Home and School Environment and Their Effect on Problem-Solving in Elementary School Children

Problem. This study is an extension of the previous study on the effect of teaching styles. Two factors were added to the previous study. The parents of the children included in that study were asked to fill out a Parental Attitudes Research Instrument. The second factor consisted of an administration of the learning task under conditions of extrinsic social and intrinsic nonsocial reinforcement. These steps were added because we were interested in investigating the effects of home and school environment on creativity and problem-solving in children. Specifically, we expected similarities in home and school with regard to the existence of authoritarian-closed and democratic-open learning environments and therefore a similar and probably cumulative effect of these two environments on a child's creativity and problem-solving. Finally, we were interested in testing the hypothesis that creativity would related to a more autonomous approach of the child to problem-solving, a process we have tried to get at in our intrinsic nonsocial condition of reinforcement for learning.

Although the analysis for investigating the relationships outlined above is not yet completed, a preliminary report can be given of the relationships between home and school environments in their effect on problem-solving in children.

Subjects. The sample, its selection and composition, was exactly the same as the one described in the previous study. Briefly, sixty-four children were selected from two second and two fourth grade classrooms. The children were homogeneous with regard to I.Q. - Lorge-Thorndike, M = 124 - and SES (Middle class).

Procedure. Classroom Environments (Teaching Styles) - Nine teachers were rated on scales developed by us. One extreme, namely, Democratic-Open-ended (Style A) was defined as follows: Teacher allows children a wide range of choices, encouraged exploration, makes little distinction between work and play, uses flexible curriculum, is child oriented, and uses praise as major method of reinforcement. The other extreme, namely Autocratic-Closed, (Style B) was defined as follows: Teacher issues orders, expresses disapproval frequently, is detached, group oriented, emphasizes distinction between work and play, gives learning experiences consisting of provision of facts, follows a strict curriculum, controls the use of materials and use of classroom space.

The second and fourth grade teachers were rated independently by two raters. Those two teachers at each grade level who most nearly approached the opposing extremes of the scales were selected.

Experimental Environment (Teaching Styles) - Subjects were assigned randomly to experimental groups on the basis of sex. Each group had four boys and four girls.

Each experimental group was taken in turn from the classroom to a separate area. The experimental treatment extended for one hour, four times a week on Monday, Tuesday, Thursday and Friday. During that hour, the experimenter acted out different roles, depending on teaching styles A and B.

The authoritarian experimental experience was as follows: A story was introduced as being very interesting, one to which the children should pay close attention so as not to miss any of the details. Seats were arranged in rows and assigned to children by the Experimenter for the duration of the experiment. E remained behind the desk in the front of the room as much as possible. The story was selected by E and read to the children. They were then asked four or five questions which could be easily answered by facts contained in the story. E responded to answers by nodding and saying "Un-huh". Ouestions were not encouraged and if asked were answered briefly by factual reference to the story material. Pencils and paper were distributed and Ss were asked to copy a drawing of the main character of the story from a sample shown by E. E attempted to create a positive climate while remaining aloof.

The democratic experience was as follows: E introduced the story as interesting and fun. The children were asked to bring chairs and to gather around the E in the front of the room. E read a story selected from those available by group consensus. E paused at intervals, four or five times in the reading to ask the group for ideas as to "what they think will happen next in the story." Comments during and following the story were consistently encouraged. Pencils and paper were distributed and Ss were asked to draw someone or something from the story which they liked or which interested them. E behaved in a warm manner towards the children and attempted to create a positive climate.

Neither experimental condition was intended to be a teaching situation since, following the purpose of the experiment, E sought to recreate the total climate of the existing learning environments rather than to provide training for any specific entity of the creative process.

Parental Environment: Selected scales from the Parental Attitude Research Instrument were combined on the basis of a factor analysis carried out by R. Bell and Earl Shaeffer (personal communication) to extract two dimensions of maternal behavior. One of the dimensions was high to low authoritarian control and the other was high to low maternal rejection.

Reinforcement and Problem Solving: Since we used a repeated measure design for the two conditions of reinforcement, two different learning tasks were employed. Task I was the same as the task described in Studies III, IV-A and IV-B earlier in this report. Briefly, an object was hidden under one of three boxes which were identical except for size. The object is always hidden under the middle-sized box but the position of the box was varied on each trial according to a prearranged randomized order. Task II was a right-left alternation, that is, the hidden object was placed alternately under the extreme right and left of three boxes. On both tasks the subject was instructed to guess the correct box hiding the object on each trial. The tasks were administered for 50 continuous trials without opportunity for correction on any one trial. The subject continued until he reached a criterion of six consecutive errorless trials or the completion of 50 trials. The order of the tasks was controlled so that half of the subjects in the various experimental groups received Task I first and the other half Task II first. The combination of task with type of reinforcement was controlled in the same way. One type of reinforcement was extrinsic-social and the other intrinsic-nonsocial. These two types of reinforcement have also been described earlier in the report in Studies III, IV-A and IV-B. Half of the children received the extrinsic social reinforcement first and the other half intrinsic nonsocial reinforcement first. Each type of reinforcement was applied 50 per cent of the time with Task I and 50 per cent of the time with Task II. All children performed Task I prior to the post-testing of the Torrance Creativity Test and Task II following completion of the Torrance Creativity Test. The learning task was administered by three white female and one white male adult.

Results. Three analyses of variance were carried out. The first analysis was a 2 x 2 x 2 x 2 analysis of variance. The four factors were: grade of child, a background of authoritarian versus democratic teaching style in the classroom, exposure to authoritarian versus democratic experimentally reproduced teaching style, and extrinsic-social versus intrinsic-nonsocial reinforcement. The dependent measures were the total number of errors made in 50 learning trials. Two significant findings emerged from this analysis.

The first was a significant improvement with age, that is, fourth grade children learned better than second grade children ($F = 5.33$, d.f. 1/56, $p < .05$). The second significant finding was an interaction between grade, teaching style in the classroom, and experimentally reproduced teaching style ($F = 5.60$, d.f. 1/56, $p < .05$). The direction of the interacting variables are plotted in Figure 1. Simple main effect tests were carried out to determine the source of the significant interaction. It was found that the second grade children, who had experienced a consistent democratic-open teaching environment, that is, both in the classroom and in the experimentally produced teaching situation, performed significantly better on the problem-solving task than children who had been exposed to inconsistent teaching styles in the classroom and in the experimental situation (For E_1C_1 versus E_1C_2, $F = 5.53$, d.f. 1/56, $p < .05$ and for E_1C_1 versus E_2C_1, $F = 3.71$, d.f. 1/56, $p < .10$). No significant differences emerged from the simple main effect test in the fourth grade children. Thus, we may conclude that young children benefit most from a consistent experience of a democratic-open learning environment.

The second analysis of variance was carried out on the same factors, except that the experimentally produced environment was replaced by a home environment factor. The four factors were grade of child, experience of teaching style in classroom and home environment. Classroom environment referred to authoritarian versus democratic teaching style. Home environment referred to a dimension which ranged from high to low authoritarian control by mother over child. The fourth factor was intrinsic-extrinsic reinforcement. Three significant findings emerged from this analysis. First, fourth grade children again performed significantly better than our second grade children on the learning task. ($F = 7.06$, d.f. 1/49, $p < .05$) Secondly, an interaction

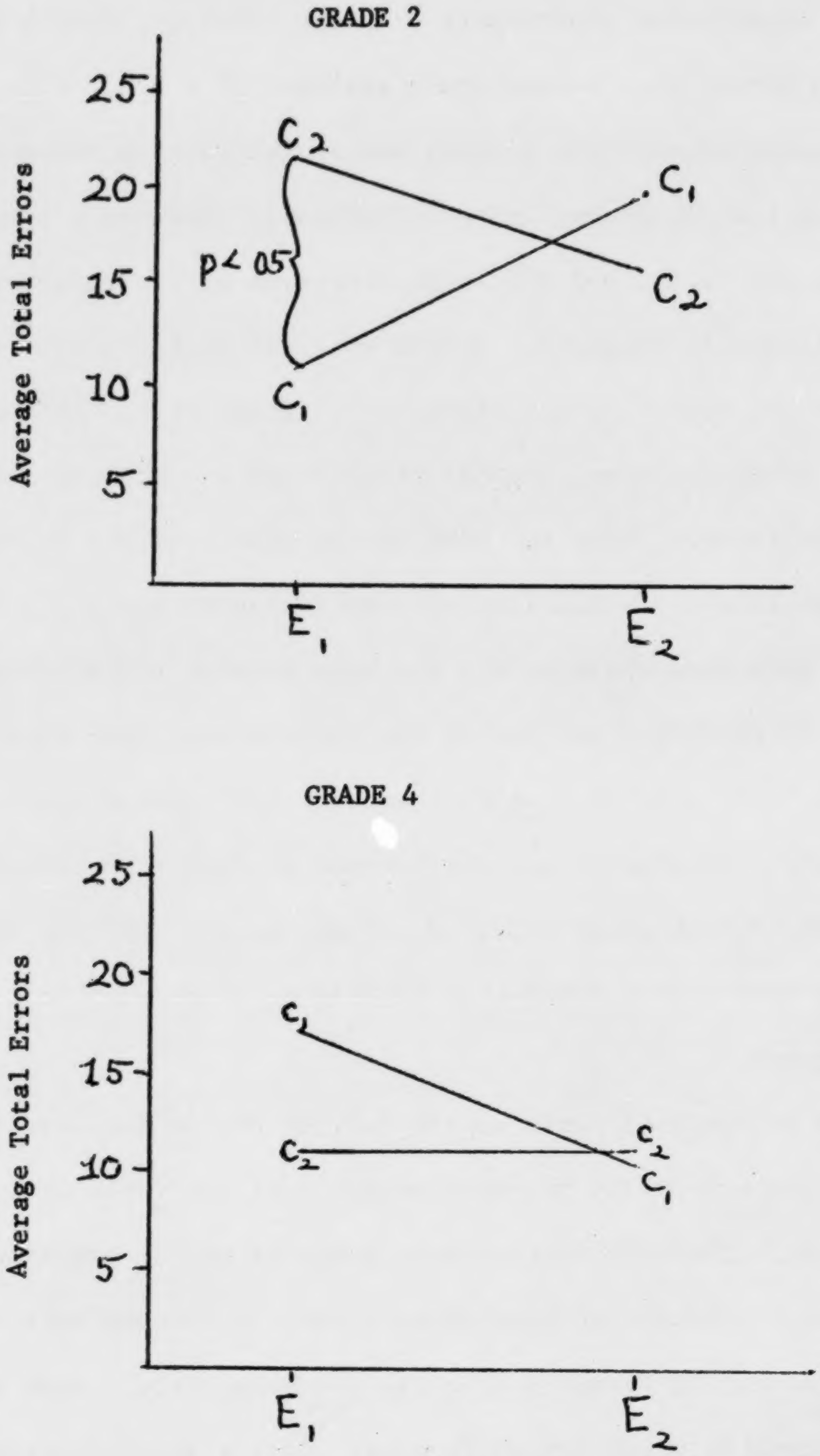


Figure 1: Interactions Between Deomcratic (C_1) - Authoritarian (C_2) Classrooms and Democratic (E_1) - Authoritarian (E_2) Experimental Conditions

was found between grade of child and home environment ($F = 6.32$, d.f. 1/49, $p < .05$). The direction of the interaction is plotted in Figure 2. Children coming from a democratic home environment differed in age-appropriate ways, namely fourth graders performed significantly better than second graders ($F = 15.38$, d.f. = 1/49, $p < .01$). In contrast, second and fourth grade children coming from authoritarian homes showed no difference in their performance in our learning task and fell between both the better performance of the fourth graders and the poorer performance of the second graders with a democratic home background. The simplest interpretation of this finding would be that children coming from a democratic-open home environment show more developmentally appropriate differences than children coming from an authoritarian environment. The third significant finding that resulted from this analysis was a triple interaction between classroom environment, home environment, and type of reinforcement ($F = 5.11$, d.f. 1/49, $p < .05$). The directions of the interaction are plotted in Figure 3. . The main source of this interaction, as tested by a simple main effects test, comes from a difference between children exposed to a consistent democratic home and classroom environment versus children exposed to a democratic home and authoritarian classroom ($F = 4.13$, d.f. 1/49, $p < .05$). Children who experienced a consistent democratic home - school environment performed significantly better under task intrinsic reinforcement, which means that they were more autonomous in the learning situation and more able to make learning a self-rewarding experience than children with a discontinuous home - school background, that is, a democratic mother and authoritarian (female) classroom teacher.

A third analysis of variance was carried out as a 2 x 2 x 2 x 2 factorial design. Again, the first two factors were grade of child and classroom environment, but the third factor was the dimension of home environment ranging

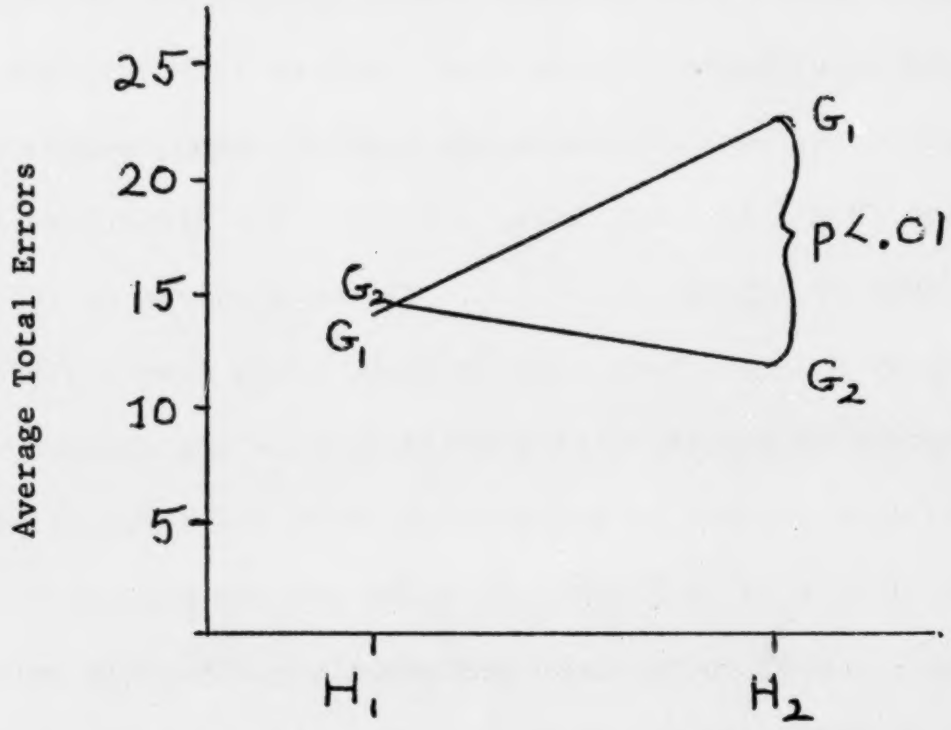


Figure 2: Interaction Between Grade 2 (G_1) - Grade 4 (G_2) and Authoritarian (H_1) - Democratic (H_2) Homes

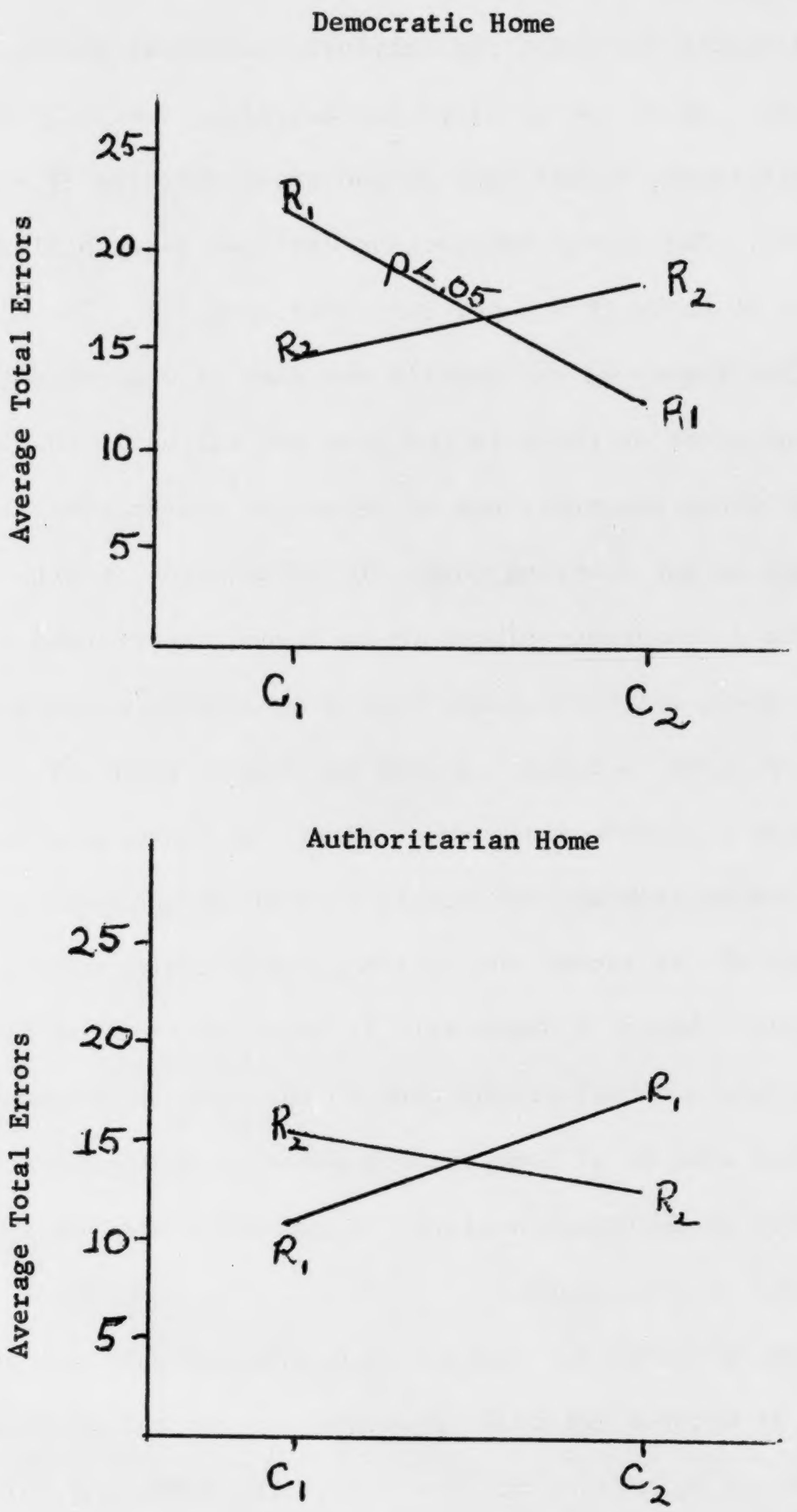


Figure 3: Interactions Between Intrinsic (R_1) - Extrinsic (R_2) Reinforcements and Authoritarian (C_1) - Democratic (C_2) Classroom Environments

from high to low maternal rejection and intrinsic nonsocial versus extrinsic social reinforcement. As in the previous two analyses, fourth grade children again learned significantly better than second grade children ($F = 5.93$, d.f. = 1/49, $p < .05$). The second interaction was that between classroom environment and grade of child ($F = 4.40$, d.f. 1/49, $p < .05$). The direction of this interaction (See Figure 4) was exactly the same as was found between home environment and grade of child in the previous analysis. Children coming from democratic classroom environments showed an age-appropriate difference in their performance on our learning task. In other words, fourth grade children coming from a democratic classroom environment performed significantly better than second grade children coming from a democratic classroom environment ($F = 12.35$, d.f. 1/49, $p < ,01$). Second and fourth grade children coming from an authoritarian classroom environment showed no difference in their performance in the learning task and the scores of both groups were somewhere between the extremes of the second and fourth graders coming from a democratic classroom environment. Again, a democratic learning environment facilitates developmentally appropriate differences between children in a learning situation. The identical effects of home and classroom environments strongly supports the validity of empirical measures of authoritarian versus democratic environments employed in this study.

The significant finding that emerged from this analysis was an interaction (See Figure 5) between maternal rejection and the child's response to different conditions of reinforcement ($F = 4.75$, d.f. 1/49, $p < .05$). The major source for this interaction was the finding that children coming from affectionate non-rejecting mothers performed significantly better under conditions of extrinsic social reinforcement where the adult was supportive during the learning situation than under intrinsic nonsocial reinforcement

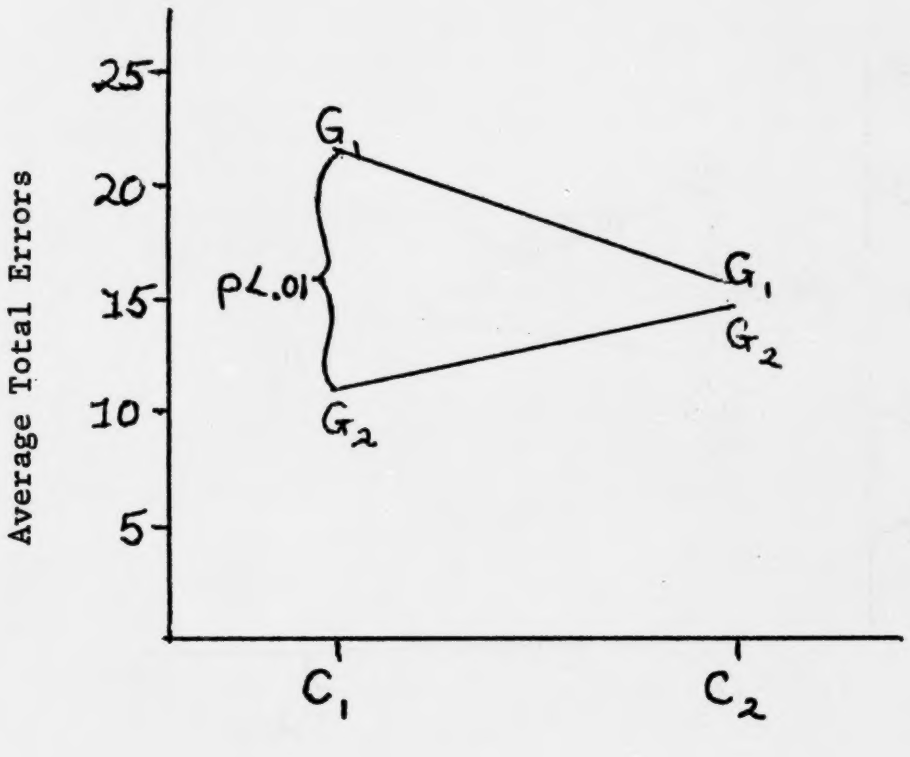


Figure 4: Interaction Between Grade 2 (G_1) - Grade 4 (G_2) and Authoritarian (C_1) and Democratic (C_2) Classroom Environments

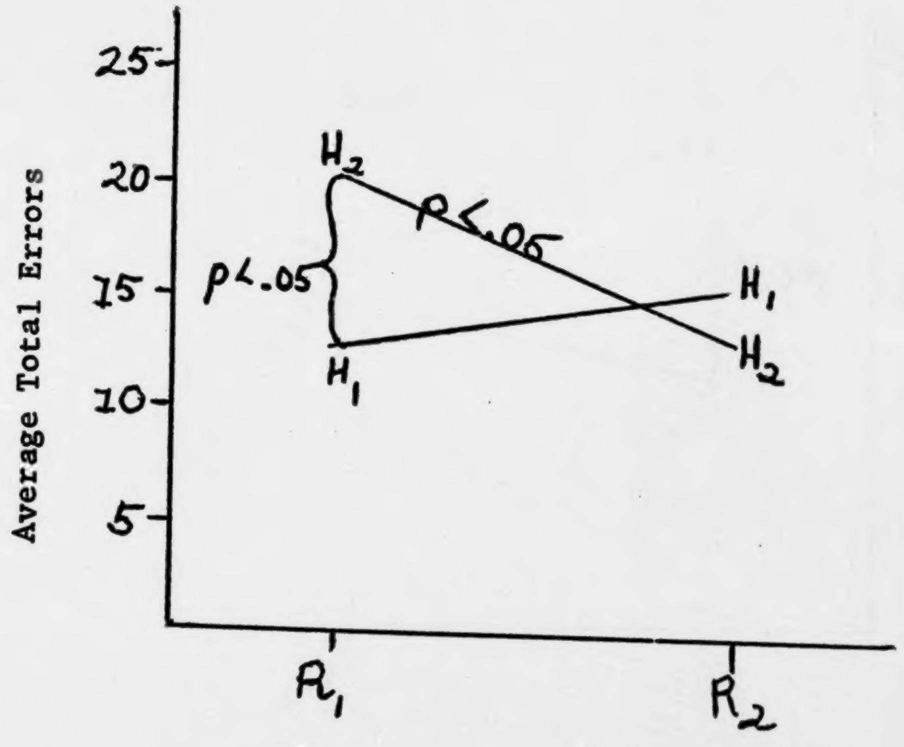


Figure 5: Interaction between High (H_1) - Low (H_2) Maternal Rejection and Intrinsic (R_1) - Extrinsic (R_2) Reinforcement

where the adult was detached and nonsupportive during the learning situation ($F = 5.81$, d.f. 1/49, $p < .05$). Moreover, children from non-rejecting mothers performed more poorly than children of rejecting mothers under the intrinsic reinforcement condition ($F = 6.42$, d.f. 1/49, $p < .05$). An important implication of this finding is the light it throws on the meaning of our two conditions of reinforcement to the child. Apparently, these children interpreted the extrinsic social situation as one in which the adult is accepting and affectionate whereas the intrinsic, nonsocial situation was perceived as one in which the adult is detached, hostile and rejecting. It would seem that children learn better under the condition of reinforcement which matches the type of reaction they have learned to expect from their mothers. Since three of the four experimenters were female adults, such a generalization would be facilitated.

In summary, the present study yielded meaningful relationships in which a child's home environment and his classroom environment, both separately and together, produce consistent effects on a child's reactions in learning situations outside the home and outside the classroom.

STUDY VIII

PERCEPTION OF TIME RELATED TO MORAL JUDGMENT AND MORAL CONDUCT: A DEVELOPMENTAL STUDY WITH LOWER-CLASS CHILDREN*

Problem:

The present report deals with a part of a larger study which was first reported at these Meetings one year ago. For the purpose of continuity, the essence of the earlier report will be summarized briefly. This earlier report dealt with the hypothesis that the formation of the "concept" of time is closely related to the development of both moral judgment and moral conduct. The proposed rationale for this hypothesis was that the child's ability to order events along a temporal dimension is related to his ability to evaluate moral situations and this in turn was considered essential for the development of both moral conduct and moral judgment. The data reported gave strong support to this hypothesis.

The study to be reported today deals with the child's perception of time and its relationship to moral judgment and moral conduct dictated by developmental changes in this time perception. Perception constitutes a critical link between stimulus and response, impulse and action. It is less essential for the grasp of concepts and principles which the individual must apply in order to interpret events as being moral or immoral, in short to make moral judgments. However, perception is an essential factor in the regulation of impulse expression, so that an individual acts with more or less delay in response to a need or an urge. An important component here, is the voluntary inhibition and delay of response. This proposed interaction between impulse perception, voluntary inhibition of response and perception of the passage of time forms the rationale for the predicted relationship between time perception and moral conduct.

---

* Presented at the Annual Meeting of the Eastern Psychological Association, Philadelphia, Pennsylvania, April, 1969.

In contrast to the rationale for a relationship between perception and moral conduct, it is not immediately apparent why one should assume a relationship between perception of time and moral judgment. In our earlier paper, we hypothesized a relationship between the ability to conceptualize various aspects of time to the ability to make mature moral judgments because of an underlying cognitive process common to both operations. However, perception of the duration of the passage of time does not require abstract thought processes and it was therefore hypothesized to be less essential to the development of mature moral judgment than to the regulation of moral conduct.

Another major objective of the present study was to investigate developmental changes in the major variables as well as in the hypothesized relationships between them.

On the basis of the foregoing discussion, the following hypotheses were formulated and tested:

I. The child's ability to accurately perceive the passage of time is related to his moral conduct.

II. The development of the child's ability to accurately perceive the passage of time is not significantly related to the development of his moral judgment.

Subjects:

The present study attempted to examine these questions in a sample of lower-class Negro children, a population in which socialization and moral conduct are issues of particularly urgent concern. These subjects were drawn from three large schools in the urban slum area of North Philadelphia. The neighborhood surrounding these schools is inhabited almost entirely by lower-class Negro families.

The children were selected from the kindergarten, second, fourth, and sixth grades. The average ages of these children were: 5 years and seven months; seven years and nine months; nine years and ten months; and eleven years and eleven months. An attempt was made to control for intelligence. In two schools it was possible to make the selection from classes of known average ability because of the fact that they had homogeneous grouping according to intelligence. In the third school and in the kindergarten groups of all schools, the teachers assisted in limiting the sample to children with average ability.

The sample consisted of 144 children made up of eighteen boys and eighteen girls from each grade. These groups were further subdivided into equal numbers of high and low moral conduct subjects.

Procedure:

The measure of moral conduct was based upon teacher judgments. The child was judged to be high or low in moral conduct based upon the following criteria presented to each teacher:

> We would like you to select X number of boys and X number of girls according to the following criteria:
>
> 1. Average ability
> 2. Honesty
>   Does not cheat on tests
>   Does not take the possessions of other children
> 3. Cooperation
>   Gets along well with peers
>   Although not necessarily quiet or submissive he does not provoke quarrels or disturbances.

The teacher was asked to conceal her judgment of the moral conduct of the child from the examiner until all subjects had been tested.

The measure of moral judgment was based upon eighteen stories from Piaget. Piaget had used these inquiries to measure developmental change from heteronomous to autonomous morality. Heteronomous morality is based upon the external consequences of behavior and on conformity to adult rules, while autonomous morality is based on the intent of behavior and internalized standards. In 1957 G. Medinnus had adapted eighteen of these questions to investigate the development of moral judgment in four groups of lower socioeconomic white children of approximately the same ages as the children in this study. He used Lerner's scoring system. Medinnus's method was further adapted to the language of the lower-class Negro children and to the needs of the present study which required a single score for each item.

Perception of time was measured by the method of reproduction. The child was asded to reproduce three 10, three 20, and three 30 second empty intervals bounded by a visual and an auditory stimulus. The intervals were randomly presented. For the test runs, the examiner presented the interval to the subject by means of a Lafayette Code Oscillator which was equipped with both a light and a buzzer. As she did this, she described her activities to the subject. He then was asked to reproduce an interval of equal length. Instructions were to "press down the key, then wait just as long as I did and then press it down again". Measurement of the reproduced intervals was made by means of a stop watch. The score was based upon the percentage of deviation from the standard, i.e., the extent to which the child's reproduced interval deviated from the time interval presented by the examiner. Directional deviation from the true interval, that is, overestimation was determined and analyzed separately.

All tasks were individually administered by the same white female examiner in a private room within the child's school building. The children appeared to be most eager to participate and rapport remained good throughout the testing period.

Results:

As reported last year, we found clear developmental trends for the concept of time and for moral judgment. It is interesting to note that we found the same developmental trends for the perception of time (see Table I). There was a definite increase in mature moral judgment form kindergarten to grade four reflected by a decrease in moral realism. This improvement leveled off at grade four with no further developmental change observable in the oldest subjects. Similarly, the concept of time and perception of time from kindergarten until the fourth grade, with little or no improvement between the fourth and sixth grade. All these developmental trends were significant ($p < .01$) when analyzed by analysis of variance. Sex differences were not significant and there was no sex by age interaction.

Relationship between the perception of time, moral conduct and moral judgment are reported in Table II.* In our earlier discussion it was pointed out that perception might be more relevant to impulse control and response inhibition than to complex cognitive processes. Perception of time was therefore predicted to relate to moral conduct rather than to moral judgment. As hypothesized, time perception and moral conduct were found to be significantly correlated at all grade levels. There was a single exception which occurred at grade two where one of the three intervals failed to yield a significant relationship. The meaning of this exception will be discussed later. The relationship between moral conduct and time perception was also tested by two non-parametric statistical measures, the Moses Test of Extreme Reactions and the Runs Test and was found to be significant ($p < .05$) for the most part, i.e., in 75% of the cases.

---

* Relationship between moral conduct and moral judgment reported in the table have been reported and discussed in last year's paper and are repeated here only for the purpose of clarity of presentation.

Another interesting and important finding was that those errors in the perception of time which consisted mainly of overestimation of the passage of time were significantly related to the age and moral conduct of the subject. Theis was tested by means of Chi Squares and found to be significant ($p < .05$) at the kindergarten and the second grade levels. In other words, to a younger child and to a child who has difficulties with moral conduct even short periods of time appear to be much longer than they are, especially if it involves voluntary delay of response or waiting.

In sharp contrast to its relationship with moral conduct, perception of time correlated with moral judgment only in kindergarten but failed to correlate in second, fourth and sixth grade children. Thus our hypothesis appears to be affected by developmental change. Prior to six years of age, perception of time relates equally to moral conduct and moral judgment. However, on subsequent levels of development, up to and including sixth grade, perception of time relates only to moral conduct and not to moral judgment. Our cognitive measure, namely a child's concept of time which was reported in last year's paper correlated equally strong with both moral conduct and moral judgment over the entire age range. It would therefore appear safe to conclude that our two measures of psychological time relate differently to our two aspects of moral functioning and that these differences are affected by developmental change.

Finally, reference to Table II will point out another interesting finding, namely that there is lower correlation among all variables at the second grade. These lower correlations appear to support the findings and theoretical formulations of Piaget who postualtes non-synchronous development at the prestage levels. Our second grade subjects were at a prestage level. The average age of our second grade subjects was seven years and nine months which is slightly less than eight, the age at which a change toward higher cognitive operations and autonomous moral judgment was reported by Piaget.

Summary and Conclusions:

The present study investigated developmental changes in psychological time and in moral functioning in lower class children between five and twelve years of age. Developmental changes were found in both variables. However, these changes leveled off at the fourth grade with no further change in the sixth grade.

Interrelationships between perception of time and moral functioning were as follows: As predicted, the child's moral conduct related to his perception of time at all age levels, and, as reported earlier, the child's moral conduct also related to his concept of time. This suggests that moral conduct in intricately related to both perceptual and cognitive components of psychological time. An additional finding worthy of mention, was that there is greater perceptual overestimation of time in younger children and in our low moral conduct children.

Finally, the development of the child's ability to accurately perceive the passage of time is not significantly related to the development of moral judgment beyond kindergarten age. This finding supports our theory that perception is less essential for the acquisition of concepts needed to make moral judgments than it is for the control of impulse, and important factor in moral conduct.

BIBLIOGRAPHY

Fraisse, Paul. The Psychology of Time. New York: Harper and Row, 1963.

Goldstone, S. & Goldfarb, J. "Perception of Time in Children". in A. Kidd & J. Rivoire, eds. Perceptual Development in Children. New York: Internation-al University Press, Inc., 1966, 445-486.

Lerner, E. Constraint Areas and the Moral Judgment of Children. Menasha, Wisc.: Banta, 1937.

Medinnus G.R. "An Investigation of Piaget's Concept of the Development of Moral Judgment in Six-to-Twelve-Year Old Children". Unpublished doctoral dissertation, University of Minnesota, Minneapolis, Minnesota: 1957.

Piaget, J. The Moral Judgment of the Child. Translated by M. Gabain. New York: The Free Press, 1965.

TABLE I

Average Scores on Measures of Moral Judgment and Perception of Time for Eight Groups Each Consisting of 18 Boys and 18 Girls

Grade	Moral Judgment †		Perceptual Time ‡					
			10" Interval		20" Interval		30" Interval	
	boys	girls	boys	girls	boys	girls	boys	girls
K	14.9	14.7	112	162	63	107	64	97
II	12.1	12.8	43	41	44	35	48	38
IV	9.2	9.3	38	22	24	29	27	34
VI	9.2	9.8	29	35	29	32	23	35

† Higher score indicates less mature moral judgment
‡ Percentage of deviation from standard (time interval)

TABLE II

Correlations between Measures of Perception of Time (PT), Moral Conduct (MC) and Moral Judgment (MJ) in Four Groups of Children (N=36 in each group)

Measures	Time Interval	Groups			
		Kindergarten	Grade II	Grade IV	Grade VI
MJ† x MC‡		-.39*	-.17	-.43**	-.38*
PT†† x MC‡	10"	-.59**	-.39*	-.33*	-.48**
	20"	-.46**	-.22	-.46**	-.92**
	30"	-.69**	-.34*	-.61**	-.58**
PT x MJ‡‡	10"	.41*	.07	.09	.02
	20"	.40*	-.14	.12	.01
	30"	.32*	-.21	.26	.20

† Higher score indicates: Less mature moral judgment and
†† less accurate perception of time
‡ Biserial coefficient of correlation
‡‡ Product moment correlation
* P < .05
**P < .01

APPENDIX A

STUDY IV A

I. Identification

1. a) Name of person filling out form______________________________
(last) (first) (M)

b) Relationship to child______________________

2. a) Name of father______________________________
(last) (first) (M)

b) Address of father______________________________
(number) (street) (city) (state)

c) How long at address______________________

3. a) Name of mother______________________________
(last) (first) (M)

b) Address of mother______________________________
(number) (street) (city) (state)

c) How long at address______________________

II. Housing

a) How many rooms in house______or apartment______in which child lives

b) Number of rooms, not including baths______where child lives

c) Number of people living in house______or apartment______in which child lives.

III. Education

1. Father

a) Last grade of school completed______________________.

b) Other training or education (explain)______________________

______________________________.

2. Mother

a) Last grade of school completed______________________.

b) Other training or education (explain)______________________

______________________________.

IV. Occupation

Check (father (X), mother (✓)). Occupations are listed alphabetically. Please be careful when checking to be sure you checked the right one.

Accountant ____
Actor, Actress, ____
Advertising Agent ____
Architect ____
Artist ____
Athlete ____
Attendant at filling station or parking lot ____
Barber ____
Beutician ____
Boarding House or Lodging House Keeper ____
Boiler Worker ____
Bookkeeper ____
Building worker; construction ____
Carpenter ____
Cashier
  Bank ____
  Store ____
Clergyman ____
Clerk
  Bookkeeper, Cashier ____
  Checker ____
  Contract ____
  File ____
  Hotel ____
  Insurance ____
  Office ____
  Paymaster ____
  Post Office ____
  Printing ____
  Publishing ____
  Secretary ____
  Station ____
  Stock ____
  Toll ____
  Transportation ____
Construction Machine Operator ____
Construction Official ____
Construction Worker ____
Contractor ____
Cook; Baker ____
Counselor ____
Dentist ____
Detective ____
Editor ____
Electrician ____
Elevator Operator ____
Engineer
  Civil ____
  Chemical ____
  Electrical ____
  Traffic ____

Fireman ____

Garage Worker ____
Gardener ____
Grounds Keeper (parks; cemeteries) ____
Grader; Inspector ____
Guide
  Sightseeing ____
  Travel ____
Housewife ____
Inspector (building or equipment) ____
Instructor
  College ____
  High School ____
  Grade School ____
  Kindergarten ____
Janitor; Custodian ____
Knit Goods Worker ____
Laboratory Technician ____
Lawyer ____
Leather Products Worker ____
Librarian ____
Locomotive Engineer or Fireman ____
Mail Carrier ____
Manager ____
  Hotel ____
  Kennel ____
  Office ____
  Personnel and Employment ____
  Plant ____
  Sales ____
  Station ____
  Stock ____
  Store ____
  Wholesale ____
Nurse (trained) ____
Nurse (registered) ____
Office Machine Operator ____
Oiler of Machinery ____
Optician ____
Painter (construction and maintenance) ____
Paper Hanger ____
Pharmacist ____
Photographer ____
Physician ____
Plant Official ____
Plasterer ____
Plumber ____
Policeman ____
Psychologist ____
Public Relations Worker ____

Radio Operator ____________________
Reporter ____________________
Roofer ____________________
Routeman ____________________
Salesman ____________________
Secretary
  Administrative ____________________
  Business ____________________
  Corporate ____________________
  Executive ____________________
  Legal ____________________
  Medical ____________________
Social Worker ____________________
Statistician ____________________
Surveyor ____________________

Tailor ____________________
Teacher
  College ____________________
  High School ____________________
  Grade School ____________________
  Kindergarten ____________________
Telephone or
  Electrical Serviceman ____________________
Transit Operator ____________________
Tree Pruner ____________________
Upholsterer ____________________
Veterinarian ____________________
Vocational Training Teacher ____________________
Welder ____________________
Woodworker ____________________
Zoo Keeper ____________________

Other (Specify) ____

____

IV. Occupation (con't)

2. List any additional part-time jobs.

Father

Job	Hours per week
a.____________	(a)____________
b.____________	(b)____________
c.____________	(c)____________

Mother

Job	Hours per week
a.____________	(a)____________
b.____________	(b)____________
c.____________	(c)____________

V. Source of Income

1. Father (check X and specify)

Fees ____________	____________________
Profits ____________	____________________
Salary (only) ____________	____________________
Salary and Incentives ____	____________________
Wages (only) ____________	____________________
Wages and Tips ____________	____________________
Piece work ____________	____________________
Incentive only ____________	____________________
Other (explain) ____________	____________________

V. Source of Income (con't)

2. Mother (check ✓ and specify)

Fees______________ ______________________________
Profits______________ ______________________________
Salary (only)______________ ______________________________
Salary and incentives______ ______________________________
Wages (only)______________ ______________________________
Wages and tips______________ ______________________________
Piece work______________ ______________________________
Incentive only______________ ______________________________
Other (explain)______________ ______________________________

Thank you ! !

INCREASING CHILDREN'S ACHIEVEMENT BEHAVIOR AND MEASURED INTELLIGENCE THROUGH "NEED ACHIEVEMENT" TRAINING

Surang Kowatrakul and Eugene H. Stivers

Abstract

This study represents an attempt to modify McClelland's method of n-Ach training for use with pre-school children. Two hypotheses which have been raised are (1) there will be a greater increase in observed achievement behavior among children who receive achievement training than among those who do not, and (2) there will be a greater increase in IQ (Stanford-Binet) among children who receive achievement training than among those who do not.

The Ss comprised eighty-four Head Start children (forty-six boys and thirty-eight girls) whose average age was four years ten months. Ss in the n-Ach training group were twenty-four boys and twenty-three girls randomly selected from the original sample. Ss received training in small groups of two to four children. The major tasks of trainers were training in goal setting, development of achievement language, development of cognitive supports, and development of group supports. Four games were used in the training: The Monkey Chain Game, Tower Construction, Peg Board Designs, and Tinker Toy Construction. The average number of training periods was 30. Each period lasted 20 minutes. Thirty percent of experimental Ss mothers participated in a special Head Start achievement training course. The two criterion measures of the training effectiveness in the children were observed behavior and IQ. Results of the former could not be tested because of changes in teachers. Major findings are: (1) Differences between IQ of Ss who received training and Ss who did not are not significant; however, the direction of change is as predicted (2) Sex differences are not significant; however, the boys gained more from the n-Ach training than girls. In the discussion results were compared with those of other intervention projects. It was concluded that short term adaptation of McClelland n-Ach training holds promise particularly if it can be intergrated with Head Start programs, mothers can be further involved, and refinement of training techniques is continued.

Increasing Children's Achievement Behavior and Measured Intelligence Through "Need Achievement" Training

Surang Kowatrakul and Eugene H. Stivers[1]

Individual differences in need for achievement can be found among young children aged four and five years. McClelland was a pioneer in using the Aronson Graphic Expression Measure to study need for achievement in five year old children. He also discovered risk-taking preferences among nursery school aged children (McClelland, 1958). Collard (1964) found sex differences and individual differences among lower and middle class four-year-old children on a measure involving the resumption of challenging tasks. Individual differences in persistency were found. Stivers and Kowatrakul (1968) employing the same techniques as McClelland used in his study also found differences in n-Ach among Head Start Children.

Several studies on the psychosocial origins of need for achievement have found a relationship between child rearing practices or socialization and n-Ach (Winterbottom, 1953, Rosen and D'Andrade, Crandall, Preston and Rabson, 1960, Collard, 1964). The results of these studies may be summarized by referring to Rosen's proposal that two kinds of socialization practices induce achievement motivation. These are (1) achievement training or

---

[1] The authors would like to express their appreciation for assistance in this project to all those Head Start teachers who cooperated with us and, in addition, specifically to Mary Martire, Heather Rabinowitz, Malcolm Robinson, and Robert Shaffer.

training in which parents impose standards of excellence upon their child, give evidence of the high goals they wish him to set and of the extent to which they value his competence in performance. (2) Independence training refers to efforts on the part of parents in encouraging their child to act on his own, reach his own decisions, and take responsibility for the consequences of his own actions. In a longitudinal study of development from birth to adulthood, Kagan and Moss (1962) found that early childhood maternal training procedures constituent to need achievement training can have significant effects upon the later Stanford-Binet intelligence scores of girls and effects in the same direction on boys. Kagan's results suggest that appropriate need achievement training at an early age may have consequences leading to increased levels of performance on long-term measures of intellectual ability.

Coleman in a national survey of equality of educational opportunity, found that inadequacies in physical facilties, equipment, and teacher training did not make as much difference in how much students learned as did certain criticial student attitudes. Coleman also observed that schooling from kindergarten through twelfth grade does not significantly change these attitudes. Schooling does not develop (in students) the sorts of motivations which will enable them to use the existing educational opportunities, nor does it motivate them to seek new opportunities for professional growth and work satisfaction after they complete school.

The consequence of such attitudes as these is suggested by McClelland in his book, The Achieving Society, (McClelland, 1964) where it is shown that one human motive, the need for achievement, appears with much regularity prior to periods of rapid national economic growth. Rosen (1956) has found that, among a sample of adolescents, need for achievement varies with social class and follows a regression curve whose peak is at the middle class and whose base is in the lower class. These findings suggest that the attitudes associated with achievement motivation may have long-range effects upon the behavior and conditions of population categories and they raise the question of whether induced changes in attitudes in this area may not produce similar results.

The authors were interested in achievement training for young children because of their hypothesis that the earlier the child has received effective training the more long lasting will be its consequences. In 1968, Stivers and Kowatrakul launched a pilot study by administering achievement training to thirteen Head Start children in one school. In that research they employed the concept of "mother surrogate" in which the trainer, a female, role played many of the characteristics manifested by mothers of high n-Ach children. Among the trainer's responsibilities was that of cultivating achievement values among children in the experimental group. Pre-test risk-taking behavior and need for achievement (as measured by the Aronson Graphic Expression test) were compared with post-test results on these two variables. Differences between control and experimental groups were found to be statistically insignificant. Case studies, however, revealed major shifts on the part of individual children in regard to n-Ach and achievement behavior.

The present study represents an effort to employ the findings in behavioral science to maximize effective achievement motivation and behavior in an experimental sample. Because the evidence from the study of motivation indicates that motives are learned and since achievement motivation is one of the most important ingredients in scholastic attainment and individual economic advancement, it seemed worthwhile to investigate the possibility of increasing the achievement motive in a target population composed of Head Start children who seem most needful of development in this area (Deutsch, 1964). The methods and techniques of this study represent a further development from the Stivers and Kowatrakul study (1968).

Two hypotheses were proposed for investigation in this research:

1. It was expected that there would be a greater increase in achievement behavior manifestations among children who received

achievement training than among children who did not receive such training.

2. It was expected that there would be a greater increase in intelligence test scores among children who received achievement training than among children who did not receive n-Ach training.

Method

Subjects

The original sample consisted of one hundred Negro children from four Philadelphia Head Start Centers. Because of sickness and change of addresses the final sample comprised eighty-four children (forty-six boys and thirty-eight girls). The characteristics of subjects divided randomly among four groups labeled E_1, C_1, E_2, and C_2 appear in Table 1. The major reason the experiment was set up to include two experimental and two control groups was that the use of Solomon Experimental Design met the demands for comparison, assured through randomization, statistical equivalence of groups, and controlled for history and maturation (Solomon, 1948).

- - - - - - - - - - - - - -
See Table 1, page 260
- - - - - - - - - - - - - -

The characteristics of ther total sample according to sex, CA, MA, and IQ at the end of the study (Spring, 1969) appear in Table 2.

- - - - - - - - - - - - - -
See Table 2, page 261
- - - - - - - - - - - - - -

Procedure

1. Pre-test. All subjects were given the Aronson Graphic Expressions Measure to discover their initial need for achievement. The bean bag tossing game was given to each child in order to observe his risk taking behavior (McClelland, 1958). All children also were observed for a period of six weeks using the Kowatrakul Behavioral Cateogries for Observation of Preschool Children (Appendix A).

The Stanford-Binet Intelligence scale, Form L-M, was administered prior to experimental treatment to subjects only in Experimental Group 1 and Control Group 1 by a trained, Caucasian, adult female.

2. _N_-Ach treatment. Children in both experimental groups received _n_-Ach training modified from McClelland's method (McClelland, 1965). Each morning on Head Start school days from the middle of February to the middle of May a trainer at each center started training at 9:30 A.M. and continued training until 10:30 A.M. The hour of training was divided into three periods of twenty minutes each. During each period the trainer removed from two to four pre-assigned children from the Head Start classroom and took these children into the Special Training Room. The major tasks of the trainer were those of McClelland's modified _n_-Ach training which consisted of (A) training in goal setting, (B) development of achievement language, (C) development

of cognitive supports, and (D) development of group supports. The following are the techniques which were employed.

A. Training in Goal Setting Techniques. The trainer encouraged each experimental subject to arrive at specific, realistic goals in accordance with his own ability and also to compete with himself. Unrealistic, dysfunctional goal setting was discouraged. The trainer used concrete examples geared to the developmental level of the children during the course of n-Ach training to illustrate the consequences of "realistic" and "unrealistic" types of goal setting. In addition to the record the trainer kept of each child's progress, charts were used to enable the child to keep track of his own progress and his success in competition with himself.

B. Development of Language of Achievement. The trainer tried to encourage each child to think and converse in terms of goal-setting, knowledge of results, and pleasurable competition with self. Reasons why subjects received rewards were explained to children on each occasion. Phrases and terms such as "I'll try harder", "I did it", "Look how high I can do it", "I won a prize because...", "I received a larger star because...", "I'll build a higher tower this time...", were taught to the child at the time that the child manifested such behavior.

C. Development of cognitive supports. The trainer used the results of each child's performance on n-Ach games to illustrate to the child that he was the one who was responsible for the outcome of a particular task. Each time a child successfully completed a certain task the trainer gave him praise, stars, or a red badge which the child could exchange for the tangible reward of a prize. Each child pasted the stars or badges he received into his own record book by himself. The trainer also asked the child each time what he had received on the previous day and showed him how he did better every day in order to encourage the feeling that "I can do it" or "I can do a better job", thus seeking to encourage a positive self-image which would influence his future thoughts and actions.

D. Group supports. During the n-Ach training, trainers acted as persons who maintained a basically accepting, non-manipulative attitude. The message each trainer attempted to convey to each child can be expressed in McClelland's terms as "Whoever you are we accept you as a worthy individual." At the same time, trainers praised achievement behavior and encouraged other subjects in training groups to applaud a child when that child demonstrated achievement behavior, i.e., the persistency to complete a task and complete it at his own level. Occasionally a child was allowed to take his completed task, such as a tinker toy product, to his class to show to his friends and teachers.

3. Post-test. Two instruments were used to measure post-

test n-Ach behavior: the Bean Bag Tossing Game and the Kowatrakul Behavior Categories for Pre-School Children. Because of a change in teachers in two Head Start Centers between the pre- and post-observation periods, the Kowatrakul Behavior Category results could not be analyzed. Aronson's Graphic Expressions Measure was used to evaluate pre- and post- n-Ach. Stanford-Binet Intelligence Scale Form L-M was administered to all children at the end of training by a trained, Caucasian, adult male.

The games which were used in the training consisted of the "Monkey Chain Game", "Tower Construction", "Peg Board Design", and "Tinker Toy Construction".

Monkey Chain Game

This game is a most simple one but it has merit in training for persistency. There are two forms of this game.

In the first one each child is given twenty-four plastic hanging monkeys and is instructed to attach them in a vertical chain. (Each monkey is attached to each other's curved arms or legs.) The child is told to make the monkey chain as long as he can. He is allowed to use both hands and the monkeys can be attached to the top or the bottom of the chain. Only candy is given to the child as a reward. The child is asked to set his own goal before he starts. The game is simple enough that each child can do it at some level; it does not require a high level of manual dexterity but it serves a purpose in helping the child to understand the objectives of training. He sets his own goals and receives a reward according to his own pre-established goal. Attainment of a previously set high goal gains the child a higher reward than the attainment of a previously set lower goal.

In the second form of the game, the child has a more difficult task to perform. He is instructed that he may use only one hand to fasten the monkeys on to the chain. Addition of the first monkey is relatively easy but the second and third are increasingly difficult because, employing the one hand to hold up the top of the chain, the child must try to lift the next monkey from the table using only the arm of the monkey he is holding to catch it. At the same time he must not lose monkeys which are already attached to the chain. Working his way up to the maximum chain length of ten monkeys requires much persistency.

Tower Construction Game

At the outset of this game the n-Ach trainer said to the child, "Today we will build a tower. Let's see how high you can build." Then the child was shown a chart representing the actual height of towers ranging from one to twenty blocks. The trainer asked the child to point on the chart to the tower indicative of how high was his own tower building goal. Next the trainer counted the number of blocks in the tower designated by the child and gave this many blocks to him. The first goal set by the child was treated as "researching the environment" or an attempt on his part (and that of the trainer as well) to assess the difficulty of the task and his entry skill level at it. For some children the first goal setting proved to be realistic--not too difficult and not too easy. After finishing such a task the child received a verbal reward and was asked whether he would like to try to build a higher tower. For those children for whom the first goal setting was too low, the trainer observed quietly and let the child try to meet his goal. Then she remarked, "That was easy, wasn't it? Would you like to put one more on top to make a higher tower?" She permitted the child to continue piling blocks until she observed that the tower was not stable and might fall down. She then said to the child, "That's very good. Let's see how many blocks you built your tower with by counting them." Then the trainer asked, "Now would you like to build a new tower? Show me how high you can build."

Some children set themselves too high a goal. When the tower collapsed before the child attained his goal the trainer asked, "Do you know why it fell down? It fell down because the tower was too high. Do you know when it started to fall?" The experimenter then suggested that the child set a more realistic goal. The child was encouraged to think of an aspiration level at about the point where the tower began to show signs of collapse.

Peg Board Designs

The child in this task was given a nine inch by nine inch peg board and a box of vari-colored three inch pegs.

There are eight different designs at three levels of difficulty: At the first level of difficulty are included the following tasks. 1. All holes in the peg board are filled with one color. 2. The board is divided vertically, half the board filled with one color, the other half of the board with another color. 3. Each row on the board is filled in a different color.

The second level of difficulty calls for the following tasks. 1. The peg board is divided in fourths (horizontal and vertical) and filled in with four colors. 2. The board is divided into diagonal halves. 3. The board is divided into concentric squares of different colors.

The third level of difficulty requires the child 1. to divide the board into diagonal fourths or 2. to create a linear design, a zigzag, or overlapping squares.

For tasks at the first level of difficulty the child was instructed verbally and if her performed the task successfully he was rewarded with a small star. The trainer then asked the child whether he would like to do a more difficult task and at the same time the child was shown a pattern which had been finished.

The second level of difficulty resulted in a reward of a medium sized star and the third level of difficulty won the child a large star. From time to time the child received a report card to take home. Difficult work, when it was completed, could be taken by the child into his regular classroom to show to his peers.

Tinker Toy Constructions

A child is shown a number of models of tinker toy constructions ranging in difficulty from simple to complex. An example of an easy or "simple" task is a construction of a tinker toy "man" model which consists of nine pieces of material, three different shapes, and one plane. A task of medium difficulty is the construction of an animal such as a cat or a bird, which consists of thirteen to fifteen pieces, five to six different shapes, and more than one plane. A difficult task requires more than twenty pieces, seven to eight different shpaes, and three or more planes, often with moving parts. Examples of tasks at this level are an airplane construction, a fishing pole, and a teeter totter. A child is told that if he can make a simple construction he will receive a small star, that a construction of medium difficulty will yield a large star, and that a difficult will merit a large star. If he constructs a "masterpiece" of his own he will earn a badge. Finally, if he collects three badges--the equivalent of nine large stars, or twenty-seven medium stars, or eighty-one small stars--he will receive a prize. Occasionally a child was allowed to take his finished work to show to his teachers and friends in the classroom.

The trainer attempted to make sure that the child understood at the outset that he was setting up a contract to finish some work and that the more difficult the work the greater would be the reward but that (in order to train for persistency and realistic goal setting) work unfinished would not be rewarded. There were no time limits on construction.

Before a child began his task or chose his model the trainer showed him how to make a simple model of tinker toy construction and asked the child to do it on his own to make sure that the child understood the instructions.

Tinker toy construction involves both motor skills and cognitive ability.

During the period of training the use of rewards or reinforcements was integrated with four elements of achievement training. The purposes of rewards were:

1. to strengthen pleasure feelings of the child who had finished his task successfully according to his goal setting;

2. to encourage the child to try harder by setting realistic goals according to his demonstrated proficiency;

3. to teach the child to seek delayed gratification rather than immediate reward.

There were five kinds of rewards: verbal praise, physical warmth (embraces, etc.), candies, symbolic rewards, such as small, medium, and large stars and badges, and prizes (dimes, rings, toy cars, multicolored paper pads, crayons, chewing gum).

Prior to the training of children the mothers of experimental subjects were invited to participate in achievement training. These mothers were engaged in four half-days of intensive training adapted from McClelland's techniques of training for adults. This training was designed to mesh with the achievement training given their children and was intended to enable the mothers to play an effective role in reinforcing the achievement behavior taught at school. Thirty per cent of the mothers who were invited to attend participated. In an effort to increase participation mothers were contacted individually and a second training period was arranged. None of the mothers who missed the first session was able to attend the second training period. The evaluation showed that those mothers who attended the first training session regarded them as "personally worthwhile", "useful in helping my child" and they believed that the achievement training helped them in goal setting for themselves as well as for their children. They also believed that the achievement training would help their children to succeed better in school.

Results

Originally, the investigators intended to employ two major criteria for measuring the effectiveness of n-Ach training. These were IQ measured by the Stanford-Binet Intelligence Scale and observed achievement oriented behavior obtained by the point time sampling technique through the use of the Kowatrakul Behavioral Categories. However, because of a change of teachers in three Head Start centers between pre and post observation the results obtained through the latter measure could not be assessed; thus IQ remained as the sole criterion for evaluation of the effectiveness of the n-Ach training. Table 3 shows the IQs of different sample groups. The means of the IQs for boy Ss and girl Ss in E_1 and E_2 combined are 100.92 and 98.04 respectively. The means of the IQs for boy Ss and girl Ss in C_1 and C_2 combined are 95.09 and 95.07 respectively.

- - - - - - - - - - - - - - - - - - -

See Tables 3 and 4, pages 262 and 263

- - - - - - - - - - - - - - - - - - -

Table 4 presents a summary of 2 X 2 analysis of variance.[1] The effect of the n-Ach training over and above Head Start experience is not significant ($.05 < p < .1$). There are no sex differences. However, the interaction between sex and n-Ach training is borderline in significance with a p level very close to .05. Figure 1 shows the degree of the effect of training as measured by the Stanford-Binet Intelligence Scale; it indicates that boys gained more from the training than girls.

---

[1] Because of the low inter-correlation between the Aronson Graphic Expression scores and IQ, the covariance design was not used.

- - - - - - - - - - - - - - -
See Figure 1, page 266
- - - - - - - - - - - - - - -

Table 5 presents the means of individual subjects' mean distances and the range of the means of stances from target in the Bean Bag Tossing Game prior to and at conclusion of the study. Each S had two opportunities of ten trials each. The first opportunity was intended to be a practice period. The means of the first and second ten throws and of the total twenty throws are reported here. The range of the means of boys in combined E_1 and E_2 in all trials was 1 to 7.8 feet in February and was 1.6 to 9.1 feet in May. For the girls the range was 1 to 7.1 feet in February and was 2 to 9.3 feet in May. For the control groups ($C_1 + C_2$) the range of means of stance from target was 1 to 9.3 feet for boys and 1 to 9.8 feet for girls in February. At the end of the study in May, the range of mean stances for male Ss in combined $C_1 + C_2$ was 1 to 9.1 feet and 1 to 6.3 feet for girls. The mean distance of stance from target for the first ten trials and the second ten trials of boys and girls was virtually constant for the same trial period (pre or post).

- - - - - - - - - - - - - - -
See Table 5, page 264
- - - - - - - - - - - - - - -

Figure 2 shows the pre and post mean distances of stance from target in the Bean Bag Tossing Game of combined Ss in E_1 and E_2 and combined Ss in C_1 and C_2. The mean distances for combined E_1 and E_2 and combined C_1 and C_2 by sex appear in Figure 3 and Figure 4 respectively. Figure 5 represents mean distances of the pre and post stance position on the bean bag tossing game for boys and girls regardless of group.

- -
See Figures 2, 3, 4, and 5, on page 267
- -

Table 6 presents the mean percentages of boy and girl Ss' behaviors before n-Ach training observed by the use of the Kowatrakul Behavior Categories (see Appendix A). Observations took place over a period of two weeks and represent approximately 100 time samplings. Behaviors which represent 10% or more of the total behaviors for male Ss are Intent on on-going work in a cognitive area(IWCa + IWCb = 20.84%), Intent on on-going work in motor activities (IWM = 16.6 %), Passive Watching (PW = 14.1%). For girls the observed behaviors which represented more than 10% of total behaviors were Intent on on-going work in a cognitive area (IWCa + IWCb = 24.9%), Passive Watching (Pw = 17.1%), and Deferred Imitation(DI = 12.4%).

- - - - - - - - - - - - - -
See Table 6, page 265
- - - - - - - - - - - - - -

Discussion

The major purpose of this study was to determine whether McClelland's n-Ach training techniques could be adapted for use among four and five year old Head Start children. The results indicate a change in the desired direction occurred but was not statistically significant ($.05 < p < .1$). Several factors may have operated to lessen the optimum effect of the n-Ach training. (1) The initial IQs of the tested subjects in this study was high as compared with that found in other investigations with comparable subjects (Kennedy et al, 1963 and Gray & Klaus, 1965) and was similar to that secured by Gray & Klaus at the end of their intervention treatment. Mean IQ of E_1 at the beginning of this study was 96.1. For C_1 the intial mean IQ was 92.4. In Gray & Klaus's research, mean IQ shifted from 86 to 95 for T_1 and from 91 to 96 for T_2. It will be noted that the higher initial IQ resulted here in smaller absolute increase. It is possible that the children in this study were already functioning at IQ levels approaching optimum and that for this reason, further increase in IQ was particularly difficult to accomplish.

(2) Although n-Ach training in this study was carried over a period of three months it was conducted for only twenty minutes a day so that because of Head Start holidays, field trips, special events, and the high frequency of children's absences, the average number of training periods received by each child was about 30 and the number of hours of training received by most children totaled only about ten. These ten hours of training contrasted with the extensive training conducted by other investigators (e.g. two & three summers in the case of Gray & Klaus) suggest that further sophistication of the present procedure may result in significant increases in n-Ach even with extremely limited periods of training, particularly if training is incorporated with other Head Start experiences and training of mothers. Furthermore, when it is considered that the training instruments and methods which

this study employed were deliberately designed to avoid direct cognitive influence upon Stanford-Binet Intelligence Scale Test performance--in contrast with Gray & Klaus who were consciously interventionist in this area--the implications for short term n-Ach training seem all the more promising.

(3) Further, this research was plagued by many practical problems which surely interfered with the training experiences of the subjects but which would not be apt to occur were training intergrated with the total n-Ach experience. For example, the study began by employing two part time graduate research assistants for four Head Start Centers. In the midst of the training unforeseen circumstances led to the loss of one of these very competent and reliable research assistants. During the period the project was seeking a new research assistant--and we found it was difficult to locate competent, reliable female trainers who were willing to walk into the areas of the centers--the project had to rely on one trained person and the aid of undergraduate substitutes to cover all four centers. Further, the new research assistant, when she was located, required a period--necessarily in part acquired on the job--to develop her training skills and to familiarize herself with the materials. Regular Head Start personnel would, of course, even in cases of employee turnover, have much less rigid time constraints and hence would have available to them opportunities to make up the losses incurred during previous training sessions.

(4) Finally, this research appears to represent a significant advance over the pilot project conducted by these investigators a year ago. Therefore, it would seem that further refinement of training techniques to be used by Head Start teachers themselves may prove productive. At the same time it would seem that the development of new ways of reaching and training mothers may be a desirable avenue for exploration.

An examination of risk taking behavior as measured by the Bean Bag Tossing Game appears to indicate a remarkable consistency in risk-taking behaviors of this pre-school sample. The fact that the mean distances of all four groups (E_1, E_2, C_1, + C_2) during the first ten practice trials and the second ten trials were practically identical seems to suggest a well established pattern of risk-taking behavior at this age. Further, the lack of significant differences prior to and after training suggest considerable resistance to change in the behavior pattern. The location of the means of the means of stance from target between three and five feet with many cases ranging out to the extremes, either close to the target (one foot) or very far from it(over nine feet). seems congruent with the results of many studies of older age groups which have shown that extreme stance positions do occur and are commonly manifestations of fear of failure. A question may be raised as to whether the same interpretation may be given to the stable stance position found at this young age level in the present investigation. Further research is required to uncover the nature of this phenomenon and to explore the etiology of the need to avoid failure as well as the need for achievement among Head Start children.

References

Alschuler, A. S. The achievement motivation development project: A summary and review. Cambridge, Massachusetts: Harvard Graduate School of Education, April, 1967, Mimeographed.

Atkinson, J. W. (Ed.) Motives in fantasy, action, and society. Princeton: D. Van Nostrand, 1958.

Atkinson, J. W., & Feather, N. T. (Eds.) A theory of achievement motivation. New York: Wiley, 1966.

Beller, E. K. Dependency and autonomous achievement striving related to orality and anality in early childhood. Child Development, 1957, 28, 287-315.

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1963.

Collard, E. D. Achievement motive in the four-year-old child and its relationship to achievement expectation of the mother. Unpublished doctoral dissertation, University of Michigan, 1964.

Coleman, J. et al. Equality of educational opportunity. Superintendent of Documents, Catalog No. FS 5: 238: 38001, U. S. Government Printing Office, Washington, D. C., 1966.

Crandall, V. C. Sex differences in expectancy of intellectual and academic reinforcement. Yellow Springs, Ohio: Fels Research Institute, 1969, Mimeographed.

Crandall, V. J. _et al_. Maternal reactions and the development of independence and achievement behavior in young children. _Child Development_, 1960, _31_, 243-251.

Equal Educational Opportunity. _Harvard Educational Review_, 1968, _38_.

Gray, Susan W., & Klaus, R. A. An experimental preschool program for culturally deprived children. _Child Development_, 1965, _36_, 887-898.

Hollingshead, A. B., & Redlich, F. C. Social stratification and psychiatric disorders. _American Sociological Review_, 1953, _58_, 357-364.

Hunt, J. McV. _Intelligence and experience_. New York: Ronald Press, 1961.

Kagan, J., & Moss, H. A. Stability and validity of achievement fantasy. _Journal of Abnormal and Social Psychology_, 1955, _58_, 357-364.

Kennedy, W. A., Van De Riet, V., & White, J. C., Jr. A normative sample of intelligence and achievement of Negro elementary school children in the Southeastern United States. _Monographs of the Society for Research in Child Development_, 1963, _28_, No. 6.

Kerlinger, F. N. _Foundations of behavioral research_. New York: Holt, Rinehart, and Winston, 1964.

Kolb, D. A. An achievement motivation training program for underachieving high school boys. Journal of Personality and Social Psychology, 1965, 2, 783-792.

Kowatrakul, S. Some behaviors of elementary school children related to classroom activities and subject area. Journal of Educational Psychology, 1959, 50, 121-128.

McClelland, D. C. et al. The achievement motive. New York: Appleton-Century-Crofts, 1953.

McClelland, D. C. Risk taking behavior among young children. In J. W. Atkinson (Ed.), Motives in fantasy, action, and society. Princeton: D. Van Nostrand, 1958, Pp. 306-321.

McClelland, D. C. The achieving society. Princeton: D. Van Nostrand, 1961.

McClelland, D. C. Achievement motivation can be developed. Harvard Business Review, 1965, 43.

McClelland, D. C. Toward a theory of motive acquisition. American Psychologist, 1965, 20, 321-333.

Rosen, B. C. & D'Andrade. The psychosocial origins of achievement-motivation. Sociometry, 1959, 22, 185-195.

Rosen, B. C. Socialization and achievement motivation in Brazil. American Sociological Review, 1962, 27, 612-624.

Sears, Pauline S. & Levin, H. Level of aspiration in pre-school children. Child Development, 1957, 28, 317-326.

Stivers, E. H., & Kowatrakul, S. Increasing children's achievement-oriented behavior in nursery school. In T. Alexander, _Annual Report, Temple University, Pennsylvania, Child Development Research and Evaluation Center for Head Start_, 1968, Pp. 13-30.

Tyler, F. B., Rafferty, J., & Tyler, B. Relationships among motivations of parents and their children. _Journal of Genetic Psychology_, 1962, _101_, 69-81.

Veroff, J., Wilcox, S., & Atkinson, J. W. The achievement motive in high school and college age women. _Journal of Abnormal and Social Psychology_, 1953, _48_, 108-119.

TABLE 1

Characteristics of the Experimental and Control Samples: Sex, CA, MA, and IQ

Group	Sex	N	CA		MA		IQ	
			Range	Mean	Range	Mean	Range	Mean
E_1	Male	12	50.0-60.5	54.5	42.0-66.0	50.9	79-120	92.3
	Female	9	53.0-58.0	55.8	42.0-67.5	56.2	78-118	101.1
Total		21	50.0-60.5	55.1	42.0-67.5	53.1	78-120	96.1
E_2	Male	12	46.0-60.0	53.3	---	--	---	---
	Female	14	45.0-57.0	53.5	---	--	---	---
Total		26	45.0-60.0	53.4	---	--	---	---
C_1	Male	11	48.0-58.0	52.9	36.0-55.5	46.7	63-107	90.8
	Female	7	52.0-62.0	56.1	46.5-58.5	53.6	72-114	94.9
Total		18	48.0-62.0	54.1	36.0-58.5	49.4	63-114	92.4
C_2	Male	11	50.0-61.0	55.6	---	--	---	---
	Female	8	50.0-58.0	54.0	---	--	---	---
Total		19	50.0-61.0	54.9	---	--	---	---
Total $E_1 + E_2$	Male	24	46.0-60.5	53.9	---	--	---	---
	Female	23	45.0-58.0	54.4	---	--	---	---
Total		47	45.0-60.5	54.1	---	--	---	---
Total $C_1 + C_2$	Male	22	48.0-61.0	54.2	---	--	---	---
	Female	15	50.0-62.0	55.0	---	--	---	---
Total		37	48.0-62.0	54.5	---	--	---	---

5

TABLE 2

Characteristics of the Total Sample by Head Start Center: Sex, CA, MA, and IQ

Head Start Center	Sex	N	CA		MA		IQ	
			Range	Mean	Range	Mean	Range	Mean
A	Male	13	50.0-62.0	58.2	49.5-73.5	57.0	77-120	98.5
	Female	5	53.5-62.0	57.7	57.0-63.0	58.8	93-109	100.1
B	Male	15	52.5-64.5	59.3	52.5-90.0	59.4	85-152	99.1
	Female	8	54.0-63.5	59.8	49.5-84.0	58.2	84-140	98.3
C	Male	8	54.0-63.5	56.8	51.0-60.0	56.3	82-109	98.6
	Female	19	49.0-62.5	59.6	49.5-64.5	57.0	79-111	96.0
D	Male	10	54.5-64.5	59.3	49.5-69.0	56.7	82-118	95.0
	Female	6	54.5-62.0	58.8	45.0=61.5	55.3	79-101	92.3
A+B+C+D	Male	46	50.0-64.5	58.5	49.5-90.0	57.6	77-152	97.9
	Female	38	49.0-63.5	59.2	45.0-84.0	57.2	79-140	96.8
Total		84	49.0-64.5	58.8	45.0-90.0	57.4	77-152	96.7

TABLE 3

Mean IQ of the Total Sample at the End of the Study by Group and Sex

Group	Sex	N	$\bar{X}$ IQ
E_1	Male	12	102.42
	Female	9	95.89
E_2	Male	12	99.42
	Female	14	99.43
$E_1 + E_2$	Male	24	100.92
	Female	23	98.04
C_1	Male	11	95.91
	Female	7	97.00
C_2	Male	11	94.27
	Female	8	93.38
$C_1 + C_2$	Male	22	95.09
	Female	15	95.07

TABLE 4

Analysis of Variance of IQ Score Differences between Head Start Boys and Girls who Received *N*-Ach Training and who Did Not Receive Such Training

Source	SS	df	MS	F
Sex (A)	42.501	1	42.501	N. S.
n-Ach training (B)	392.745	1	392.745	2.830*
A X B	433.988	1	433.988	3.127*
Within Cell	11101.540	80	138.769	-----

* $.1 < p < .05$

TABLE 5

Means of Individual Subjects' Mean Distances and Range of Means of Stance from Target in the Bean Bag Tossing Game

Group and Time	Sex	First Ten Trials Range	First Ten Trials Mean	Second Ten Trials Range	Second Ten Trials Mean	Total Twenty Trials Range	Total Twenty Trials Mean
E_1							
Pre (Feb.)	Male	1.0-6.6	4.79	1.3-7.6	4.97	2.1-7.0	4.88
	Female	1.4-6.0	3.26	1.0-6.1	3.25	1.2-6.0	3.25
Post (May)	Male	2.0-6.2	4.28	2.0-9.0	3.78	2.2-9.1	4.03
	Female	2.0-9.3	4.21	2.0-8.9	4.27	2.5-9.1	4.24
E_2							
Pre (Feb.)	Male	1.0-7.4	3.39	1.3-7.8	3.61	1.1-5.7	3.51
	Female	1.0-7.0	3.25	1.0-7.1	2.56	1.0-5.0	2.91
Post (May)	Male	2.1-5.1	3.64	1.6-6.0	3.28	1.9-4.6	3.46
	Female	2.6-6.0	4.01	2.0-6.7	3.88	2.0-6.0	3.93
C_1							
Pre (Feb.)	Male	1.8-7.3	4.28	1.0-9.3	3.67	1.4-8.3	3.98
	Female	1.9-8.9	3.94	1.0-9.5	3.82	1.5-9.2	3.82
Post (May)	Male	1.0-4.6	2.75	1.0-5.4	2.79	1.0-4.3	2.68
	Female	1.9-5.9	3.66	1.0-4.3	2.68	1.9-4.4	2.98
C_2							
Pre (Feb.)	Male	2.0-6.3	4.77	1.7-6.1	4.38	1.9-6.2	4.10
	Female	2.4-5.3	3.81	2.2-6.0	3.80	2.3-5.4	3.51
Post (May)	Male	3.0-7.0	4.94	3.0-9.1	4.97	3.0-7.5	4.95
	Female	2.0-5.9	3.60	2.6-5.1	3.90	2.5-6.3	3.75

TABLE 6

Mean Percentages and S. D. of Total Behaviors by Sex Through Use of Kowatrakul Behavioral Categories

		IWCa	IWCb	CW	VSC	CE	IWM	TIC	TIM	SF	SH	BD	DI	MW	PW
Male	$\overline{X}$	9.2	11.5	2.2	1.8	3.7	16.6	5.3	3.5	7.9	5.3	.5	6.2	1.3	14.1
	SD	9.6	8.8	2.4	2.8	2.9	12.0	6.5	3.4	5.4	4.4	1.1	9.4	1.8	9.2
Female	$\overline{X}$	14.1	10.9	1.8	.8	4.3	7.9	7.2	1.6	6.6	3.1	1.2	12.4	.8	16.9
	SD	14.4	8.4	2.1	1.3	4.4	7.1	8.1	2.2	5.1	4.1	2.8	12.5	1.3	10.2

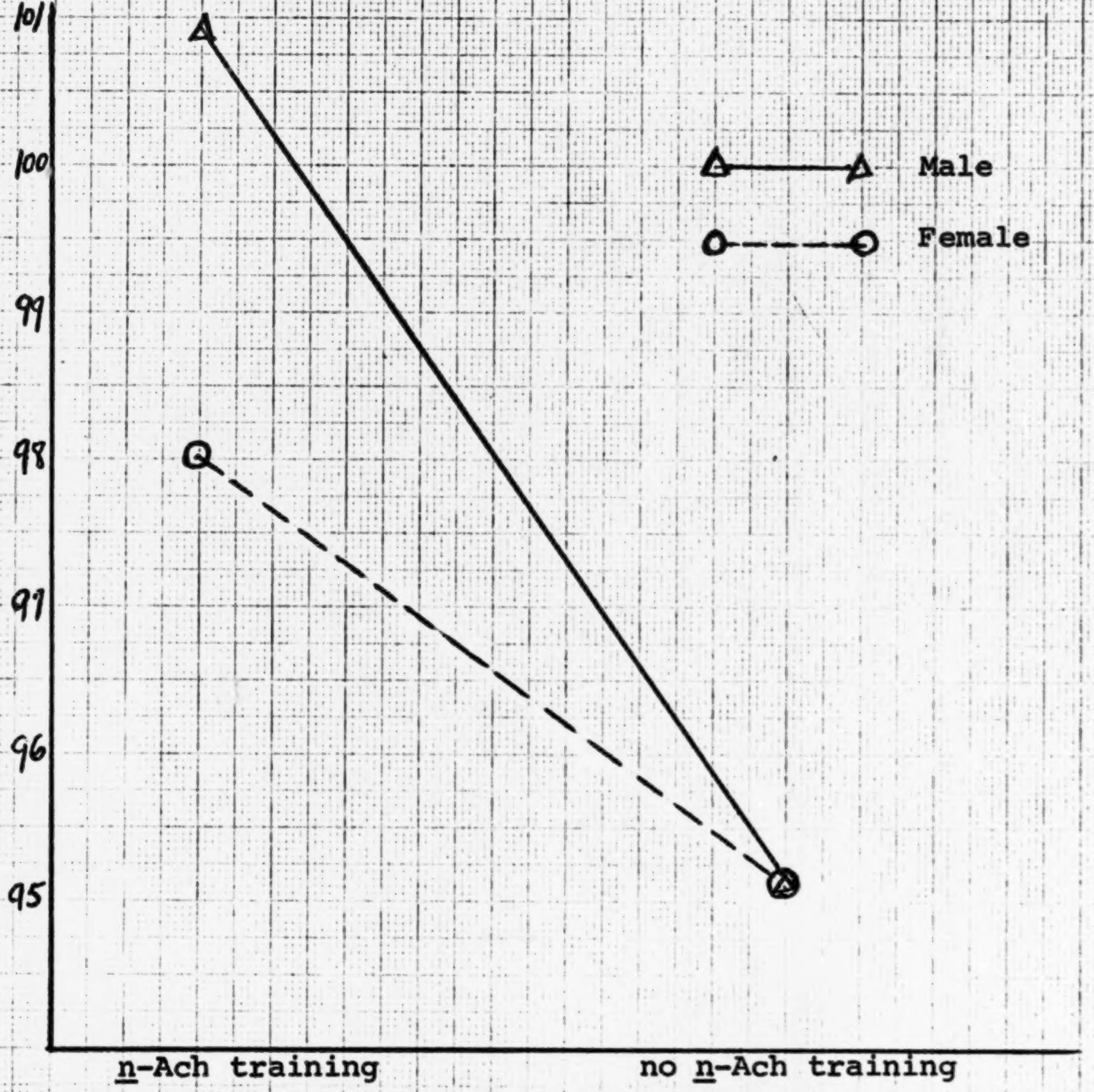


Fig. 1. Mean post IQs of Male and Female subjects who received n-Ach training and those who did not receive training.

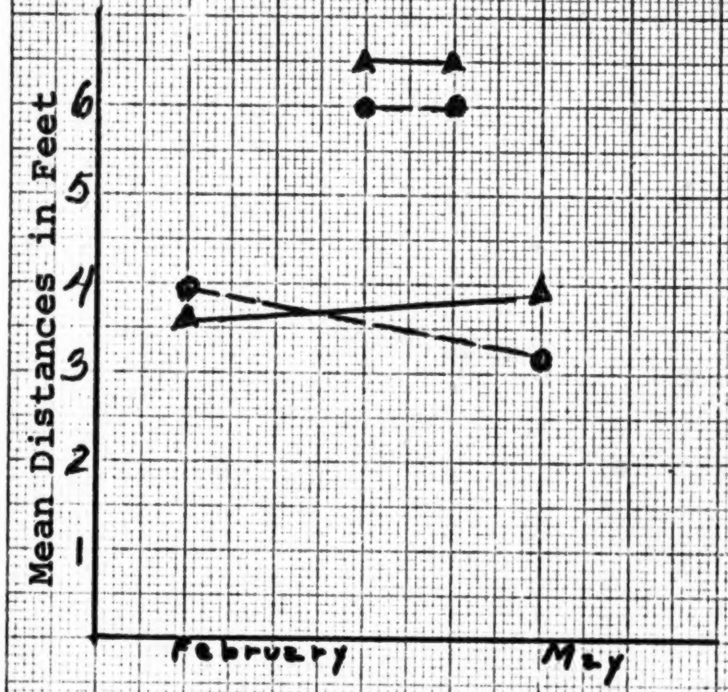


Fig. 2. Mean distances of stance from target in the B.B.T.G* for total sample which received n-Ach training and which did not receive training.

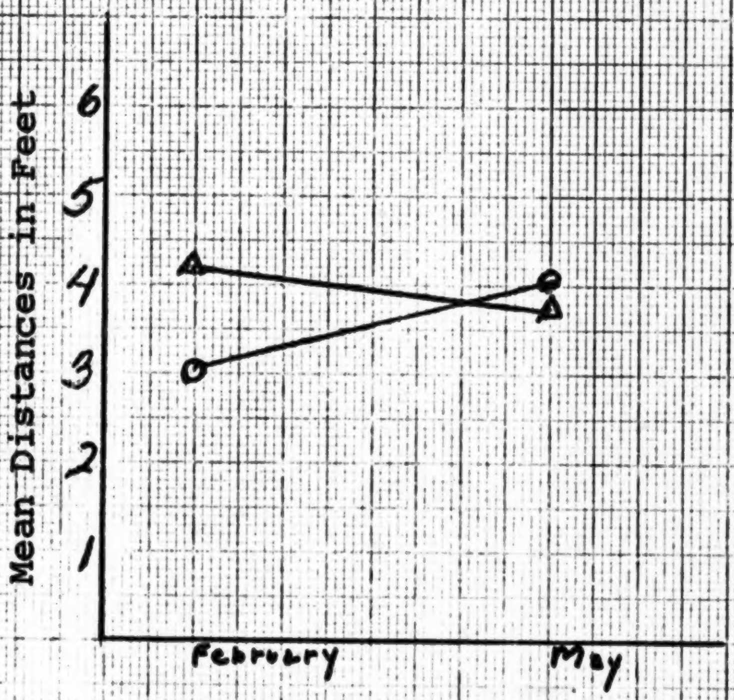


Fig. 3. Mean distances of stance from target in the B.B. T.G.* of Male and Female subjects who received n-Ach training.

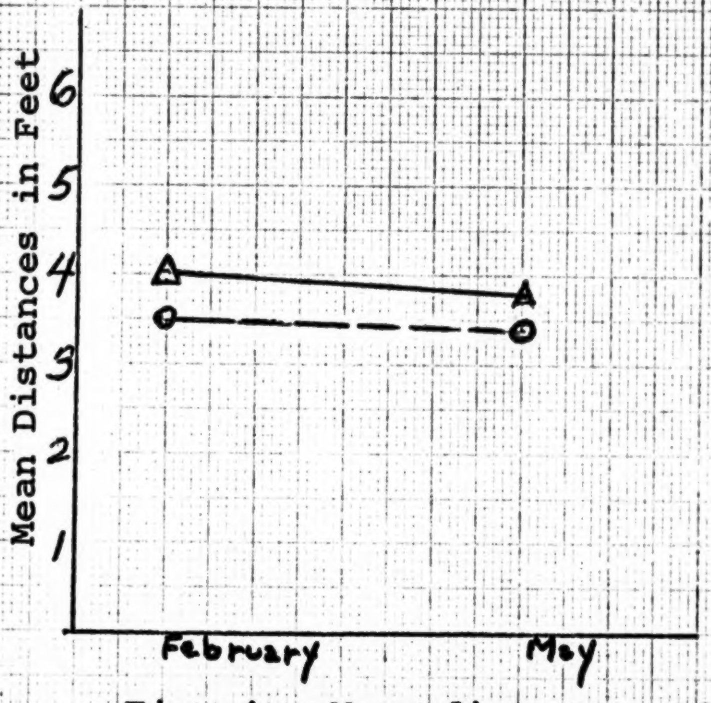


Fig. 4. Mean distances of stance from target in the B.B.T.G.* of Male and Female subjects who did not receive n-Ach training.

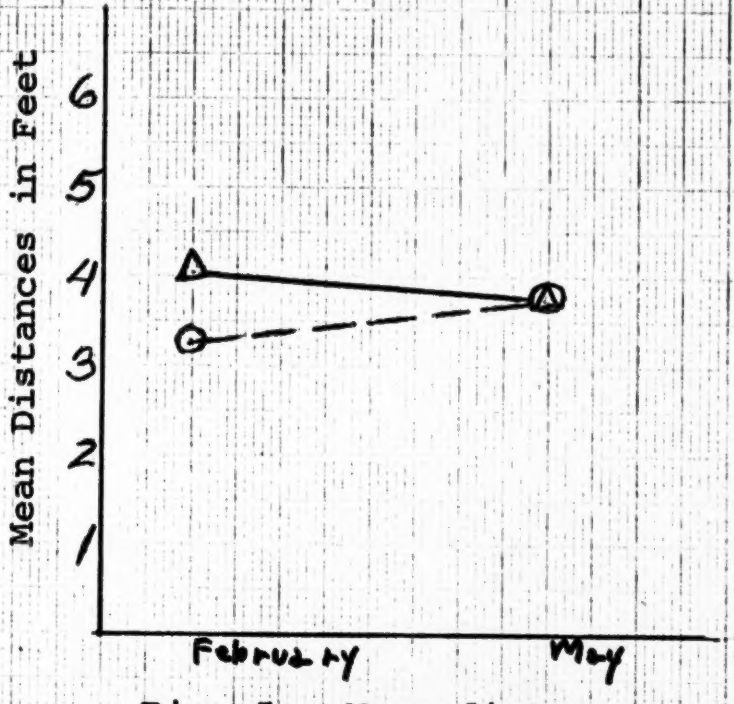


Fig. 5. Mean distances of the pre and post stance positions on the B.B.T.G.* of Male and Female subjects regardless of group.

*Bean Bag Tossing Game

BEHAVIOR CATEGORIES

Surang Kowatrakul

IWC Intent on on-going work--task oriented in a cognitive area. This category consists of behavior characterized by individual involvement with his task during free play.

VSC Self verbalizations--cognitive area. The child is talking to himself or no particular individual, asking himself questions or repeating verbalizations previously heard or invented by himself, expressing ideas to himself in the course of on-going activity.

CE Cognitive exploration. The child independently examines an object - its texture, its weight, its size or other characteristics. The child picks up objects from a cupboard or shelf, or a child explores the environment around him.

IWM Intent on on-going motor activity. The child is engaged in motor skill activity without any evident task other than mastery of or improving skill. Repetitive, active, behavior.

TIC Task Interaction Cognition: This category is divided into different areas in which the child interacts with either an adult or another child while involved in some cognitive task.

A. The child seeks help from either an adult or a peer where help may make his job easier but is not really essential.

B. The child seeks help when it is essential for completion of his task.

C. The child seeks approval in connection with his task.

D. The child seeks to assume initiative in carrying out the activity.

E. The child seeks to maintain or enhance his own status.

F. The child makes comments, remarks or asks questions related to his task and responds to questions from others.

TIM Task Interaction Motor. This category is divided into different areas in which the child interacts with others while involved in a motor skill task:

A. The child seeks help where it is not essential but is facilitating.

B. The child seeks assistance in a motor task, where without help, he would not be able to carry on the task.

C. The child seeks approval in connection with his motor skill task.

D. The child seeks to assume initiative in carrying out the motor activity.

E. The child seeks to maintain or enhance his own status in the motor skill area.

F. The child makes comments, remarks or asks questions related to his motor task.

SF Social Friendly. The child is involved in a friendly interaction with another child or with an adult. There are several different types of social friendly behavior:

A. The child gives affection to another person.
B. The child seeks affection.
C. The child receives affection (Does not seek).
D. The child shares affection of another child or of the teacher (In a group).
E. The child makes a social remark, asks a question, or makes a friendly gesture, which is unconnected with the cognitive process.

SH Social Hostility. The child is involved in an action which is negative either toward himself, an object, or another person.

A. Verbal Hostility or Agression.
B. Physical Agression against another person.
C. The child does something negative or harmful to himself.
D. The child displaces his aggression to an inanimate object.
E. The child regains possession of an object.
F. The child puts emphasis on possessions of objects and calls everything "Mine".

BD Behavior Dependency. The child seeks attention from, help from, and physical proximity and contact with an adult or another child.

A. The child seeks nurturance.
B. The child continuously seeks affection.
C, The child carries an environmental support with him and clings to it.

DI Deferred Imitation. The child imitates adults who are not present.

MW Momentary Withdrawal. The child momentarily ceases his present task and wanders or looks around, watches others without apparent reason; or withdraws from class activity.

PW Passive Watching. The child watches what others are doing, without actually participating himself.

CW Cooperative Work. The child engages in cognitive or motor activities directed toward a common goal.